

7<sup>th</sup> July 2000

## 24 Command Fire

Benton County, Washington

June - July 2000

Burned Area Emergency Rehabilitation Plan

U.S. Fish and Wildlife Service  
Department of Energy

Prepared by:

Northern States Burned Area Emergency Rehabilitation  
Team  
U.S. Department of the Interior

## EXECUTIVE SUMMARY

### Introduction

This plan has been prepared in accordance with the *Interagency Policy Guidance and Direction: Wildland Fire Rehabilitation and Restoration (1998)* signed by the Assistant Secretary of the Interior, Policy, Management and Budget and Under Secretary of Agriculture, NRE. This plan provides emergency fire rehabilitation recommendations for all lands burned within the 24 Command Fire including: public lands administered by the US Fish & Wildlife Service (USFWS), Department of Energy (DOE), Bureau of Land Management (BLM), State, and private lands of individual ownerships. The primary objectives of the 24 Command Fire Burned Area Emergency Rehabilitation (BAER) Plan are:

- ! To prescribe post-fire mitigation measures necessary to protect human life, property, and critical cultural and natural resources.
- ! To promptly mitigate the unacceptable effects of fire and its suppression on lands within and adjacent to the burned area in accordance with management policies, and all relevant federal, state, and local laws and regulations.

This plan addresses emergency rehabilitation of fire suppression impacts and fire effects. The BAER Team conducted an analysis of fire effects throughout the lands impacted by the fire. The watershed group assessed the overall watershed changes from the fire and developed a burn severity map. Archeologists inventoried suppression impacts for potential damage to cultural sites as well as initiating a cultural resource damage assessment. The vegetation specialist evaluated and assessed fire effects and suppression impacts to vegetative resources, including threatened and endangered (T&E) species, and identified values at risk associated with vegetative losses. The wildlife biologist conducted an assessment of T&E species and initiated and closed Section 7 consultation with US Fish & Wildlife Service. The GIS specialists gathered the data layers necessary for the plan, coordinated GPS activities, and transmitted the data to DOE and USFWS. The operations specialists inventoried fire suppression impacts, developed specifications for their rehabilitation and initiated repair of fence cuts.

Resource assessments produced by these specialists are in Appendix I and the treatments identified in the assessments under management/monitoring recommendations can be found in Part F. A summary of the costs by jurisdictions is in Part E. Appendix II contains the National Environmental Policy Act (NEPA) compliance documentation summary. Appendix III contains the BAER Plan maps. Appendix IV contains photo documentation and Appendix V the supporting documentation.

### Arid Lands Ecology Refuge/Hanford Reach National Monument Management

In 1967, the US Atomic Energy Commission established the Arid Lands Ecology Reserve (ALE) by administrative order to preserve "portions of vegetation types that once covered a great expanse of the West." In recognition of its ecological value, the ALE Reserve was designated as the Rattlesnake Hills Research Natural Area (RNA) in 1971 by a cooperative agreement between federal land management agencies. An RNA is a physical or biological land unit in which natural processes and features are preserved to the extent possible for research and education. The ALE Reserve is the largest RNA in the State of Washington. In 1975, the ALE Reserve was designated as a National Environmental Research Park (NERP) by the Energy Research and Development Administration. There are seven NERPs throughout the nation, all with the purpose of providing opportunities for ecological research and environmental study.

The ALE Reserve is owned by the US Department of Energy-Richland and was established as a safety and security buffer for the Hanford Site. Public access to these areas has been and continues to be restricted. The ALE Reserve represents one of the largest and highest quality parcels of shrub-steppe

habitat remaining in Washington State and provides habitat for a number of rare plant and wildlife species, as well as the Rattlesnake Hills Elk Herd. Because of its size and history of protection, the ALE Reserve retains much of its native biological diversity and supports natural landscape processes that are absent or degraded elsewhere in the region. In addition, the site has been the focus of nearly 30 years of ecological studies and consequently has a large database of information on climate, soils, wildlife, vegetation, and ecosystem functions and processes.

As a result, the draft Comprehensive Conservation Plan for the ALE Reserve identifies its goals as:

- ! Protect and restore the native habitats and biodiversity of the Hanford shrub-steppe ecosystem.
- ! Monitor, protect, and recover native plants and animals that are federally or state listed and any other species that are in any other way considered sensitive.
- ! Monitor status and trends of migratory birds, particularly those that are considered shrub-steppe obligate species and manage local populations.
- ! Provide for compatible education, interpretation, and wildlife-dependent recreational opportunities.
- ! Promote public understanding of the shrub-steppe ecosystem through scientific research and allow other compatible research opportunities afforded by the unique and isolated environment of the ALE Reserve.
- ! Manage for the protection, preservation, evaluation, and understanding of the cultural heritage and resources of the ALE Reserve while consulting with appropriate Native American groups and complying with historic preservation legislation.
- ! Provide for operation and maintenance activities without compromising ecological and cultural values.

At more than 360,000 acres, the Hanford Site is one of the largest contiguous pieces of shrub-steppe habitat remaining in the Columbia Basin. The uniqueness and biological diversity of the area was formally recognized by Presidential Proclamation 7319 of June 9, 2000 establishing this area as the Hanford Reach National Monument. The monument is described as a “biological treasure, embracing important riparian, aquatic, and upland shrub-steppe habitats that are rare or in decline in other areas. Within its mosaic of habitats, the monument supports a wealth of increasingly uncommon native plant and animal species, the size and diversity of which is unmatched in the Columbia Basin.” Because of the high diversity of native plant and animal species, the large number of rare and sensitive plant species, the well developed microbiotic crusts and significant breeding populations of nearly all steppe and shrub-steppe dependent species, the USFWS has been tasked to preserve and protect these objects of antiquity in perpetuity.

### **Department of Energy - Hanford Site Management**

The Hanford Site was established by the US Government in 1943 as a national security area for the production of weapons-grade plutonium and purification facilities. For more than 40 years, the primary mission at Hanford was associated with the production of nuclear materials for national defense. However, large tracts of land were used as protective buffer zones for safety and security purposes and remained undisturbed. These buffer zones preserved a biological and cultural resource setting unique in the Columbia Basin region.

In the late 1980s, the primary DOE mission changed from defense materials production to environmental restoration. The Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement was completed in September, 1999. Included in the assumptions for the preferred alternative are:

- ! DOE, as a Federal agency, has a Trust responsibility to protect Tribal interests.
- ! The public will continue to support protection of cultural and natural resources on the Site, especially on the Wahluke Slope, the Columbia River Corridor, the McGee Ranch, and the ALE Reserve.

### **Other Lands**

Grazing, agriculture and scenic lands on private, state, and county ownership were also impacted by the fire. The primary concern for these land ownerships is rehabilitation of suppression impacts.

### **Fire Background**

The 24 Command Fire (also known as the Two Forks Fire and the SR 24 MP 36 Fire) began at about 1330 hours on Tuesday, June 27, 2000, as the result of a fatal motor vehicle accident on State Route (SR) 24, about 2 miles west of the intersection with SR 240. The lands in the vicinity are managed as the Arid Lands Ecology Reserve (ALE) and the Hanford Reach National Monument by the US Fish and Wildlife Service, under permit from the US Department of Energy. Driven by high winds and temperatures and low humidity, the fire quickly spread over the next two days and consumed 163,884 acres of Federal, state, and private lands. The fire also burned 11 residences and a number of other structures in and around Benton City. Burned acreage included: US Fish and Wildlife Service - 78,732 acres; Department of Energy-Hanford Site - 60,254 acres; private lands - 20,225 acres; State - 3,633 acres; Bureau of Land Management - 980 acres; and McGee Ranch and Riverlands

A Type III Incident Management Team (IMT) was assigned to the fire on June 27 at 1800 hours. A Type II IMT was requested on June 28 at 0400 hours and a Type I IMT was requested at 2300 hours. A Unified Command took charge consisting of the Type I and II teams and local Fire Chiefs. The fire was contained on July 1 and controlled on July 2, 2000.

The US Fish and Wildlife Service and the Department of Energy each requested a Burned Area Emergency Rehabilitation (BAER) Team. The Department of the Interior BAER Team, Northern States (Gasser) responded. The BAER Team arrived on June 30 and began field reconnaissance. Upon arrival at the 24 Command Fire, the BAER Team was requested to prepare a BAER plan to address potential effects of the fire and fire suppression impacts to all jurisdictions affected by the fire. There were 18 people on the BAER Team with an additional six Resource Advisors to assist in the field assessment. In addition, a number of resource specialists from DOE and their contractors assisted in providing resource information.

On July 3, the helicopter assigned to the BAER Team, while on a reconnaissance flight with team members, spotted a fire near residences in West Richland. The pilot dropped off the BAER Team members and picked up the helitack crew and initial attacked the fire dropping 6 buckets of water. This quick action kept the fire to about one acre in size and protected several residences from burning. On July 5, BAER Team members inventorying suppression impacts in Snively Canyon initial attacked a flare-up preventing further damage to riparian vegetation.

On July 7, the BAER Team conducted an agency debriefing in Richland, Washington, providing preliminary findings and identifying proposed treatments. An agenda for the meeting can be found in Appendix V.

The BAER Team, tasked with evaluation of short and long-term rehabilitation needs, developed this plan to address the following issues:

- ! Facilities or improvements impacted by the fire or the suppression of the fire.
- ! Cultural and natural resource values impacted by the fire or fire suppression actions.
- ! Rehabilitation requirements established by Federal law, policies, and relevant Department of the Interior resource management mandates.
- ! Rehabilitation requirements established by state laws, policies, and regulations.
- ! Implementation of treatments in a timely manner, prior to the first damaging rains.

## **Resource Damages and Threats to Human Safety and Resources**

The 24 Command Fire burned 163,884 acres, on public and private lands within a perimeter of 255 square miles. Fire suppression impacts included: approximately 41 miles of dozer line, dirt roads graded wider, fence cuts, retardant drops on LIGO Tunnel and springs, 1 burned-over engine, and a backfire of 9,698 acres.

The entire fire has been mapped by the BAER Team for burn severity. One hundred per cent of the fire area is classified as low burn severity or unburned. This attests to the fires' rapid spread through light fuels and low residence time. There were some pockets of higher burn severity where larger sagebrush plants were consumed. Most of the soils examined were not water repellent. Therefore, an overall water yield increase due to the fire is expected to be minor and not exacerbate flooding events.

Almost all plant and litter cover that was present in the burn area have been consumed by the fire. The loss of vegetative cover has exposed fine sandy and silty soils to ablation. Nearly all soils within the burn area have a fairly high risk of wind erosion, however, certain soils within the burn area are especially susceptible. Because of this, there will be a safety concern for drivers traveling on roads in and around the burn area during periods of dust storms crossing roads creating low visibility. While dust storms may create a hazard for drivers, wind erosion is not expected to threaten water quality.

The BAER Team conducted intensive field surveys after the fire to identify impacts and compile the following recommendations for rehabilitation of affected lands:

### **Fire Suppression Treatments:**

- ! Inventory dozerlines for potential archeological sites prior to rehabilitation
- ! Rehabilitate 41 miles of dozerline
- ! Repair any additional cut fences
- ! Remove burned-over engine when investigation is complete
- ! Rehabilitate LIGO structure impacted by retardant

### **Emergency Fire Rehabilitation Treatments:**

- ! Hire BAER Implementation Leader
- ! Conduct cultural resource damage assessment of known/documented sites
- ! Protect cultural sites
- ! Install warning safety signs for dust storms and elk crossings
- ! Make 3 ground hazards safe (large holes)
- ! Control unburned non-native invasive plants
- ! Replace sagebrush plantations as critical habitat for T&E species
- ! Plant 80,000 sagebrush plants in fall of 2000
- ! Collect seed from sagebrush, bitterbrush, bunchgrass and greasewood populations
- ! Monitor vegetative recovery
- ! Install drift fencing along identified roadways
- ! Increase law enforcement patrols for safety and resource protection
- ! Monitor and control invasive plant species
- ! Monitor fire effects to T&E species

- ! Inventory mortality and monitor recovery of microbotic soil crust
- ! Follow-up consultation/review by BAER Team members
- ! Conduct public information dissemination

Specifications were developed for all actions meeting the requirements of fire suppression or Emergency Fire Rehabilitation (EFR) funding.

Because of the heightened awareness by the public of fires on Department of Energy lands (here and at Los Alamos) the BAER Team along with the US Fish and Wildlife Service - ALE Reserve, in coordination with DOE, conducted a number of media interviews for radio, television, and newspapers. The primary message was that of public safety regarding dust storms and increased potentials for elk crossing roads. In addition, the results of the BAER Team's assessments were given. To further this information sharing the USFWS and DOE will consider the posting of the BAER Plan on their websites.

In addition to conducting and developing the above assessments and rehabilitation specifications, the BAER Team initiated repair of fence cuts and posted several interior ALE Reserve roads as closed because of the powdery soils.

This plan was submitted to USFWS and DOE in accordance with interagency BAER guidelines, within 10 days of fire control.

Other resource impacts assessed as a result of the 24 Command Fire included a review of cultural sites impacted, impacts to Federally listed Threatened and Endangered species, and vegetation resources. The cultural resource assessment addressed a minimum of 190 previously recorded historic and prehistoric archeological sites, including lithic scatters to can scatters, Indian hunting sites to ranch buildings, spirit quest monuments to gas production wells. Prior to rehabilitation of the suppression lines an archeological inventory was conducted. A cultural resource damage assessment of the burn area still needs to be completed as quickly as possible.

Section 7 Consultation was initiated for Federally listed Threatened and Endangered species. There were no Federally listed wildlife species within the burn area and those T&E species listed as occurring or having habitat within Benton County did not have habitat within or adjacent to the burn area. There were a number of state listed species that were addressed as well as some species identified as being of Tribal importance. Consultation is concluded for the rehabilitation actions identified in this plan.

There was one Federally listed Threatened plant species and eight previously inventoried state listed species known to occur within the fire area. Vegetation resources provide valuable wildlife forage and habitat, watershed protection, and comprise a visually pleasing landscape. The effects of the 24 Command Fire will have both positive and negative short and long-term influences on these plant communities and in the natural regeneration processes of the impacted watersheds. Generally speaking, most sagebrush and bunchgrass communities experienced greater than 75% vegetative loss. On approximately 85% of the fire area, complete consumption of vegetative resources was observed. Most shrub, grass and forb species and organic material on the soil surface was consumed indicating extreme fire intensity. Due to the fact that the fire moved so quickly with a low burn severity, seed bank sources in the soil were not adversely impacted. The primary vegetative concerns are the recovery of the shrub-steppe plant community and control of non-native weed invasion.

It is intended that the Implementation Leader for USFWS will initiate BAER emergency fire rehabilitation treatments across jurisdictional lines to ensure critical habitat recovery of the shrub-steppe plant community. This will take coordination and possibly another Memorandum of Understanding.

This BAER Plan is the initial funding request for Emergency Fire Rehabilitation funds. This plan may also be used as a justification to seek funding from other sources. Additional supplemental requests may be made after this document has been reviewed and approved by Regional/National BAER Coordinators or approval authorities of the Department of Energy.

The Emergency Fire Rehabilitation funding for this plan extends over three years from the date of plan approval. At the conclusion of the funding period, a final Accomplishment Report will be due to the approval authority. The Accomplishment Report will document the funding received, (initial and supplemental funding), treatments installed, the effectiveness of the installed treatments and the results of monitoring activities. A template for this report is provided with this BAER Plan to USFWS.





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**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**PART A FIRE LOCATION AND BACKGROUND INFORMATION**

<b>Fire Name</b>	24 Command	<b>Date Controlled</b>	2 July 2000
<b>Fire Number</b>	P68272	<b>Jurisdiction</b>	<b>ACRES</b>
<b>Agency Unit</b>	USFWS & DOE Hanford Reach NM	<b>FWS - ALE</b>	78,732
<b>Region</b>	USFWS - Region 1	<b>DOE</b>	60,254
<b>State</b>	Washington	<b>BLM</b>	980
<b>County(s)</b>	Benton	<b>State</b>	3,633
<b>Ignition Date/Manner</b>	6/27/00 / Auto Accident	<b>FWS - McGee Riverlands</b>	60
<b>Zone</b>	Pacific Northwest	<b>Private</b>	20,225
<b>Date Contained</b>	1 July 2,000	<b>TOTAL ACRES</b>	163,884

**PART B NATURE OF PLAN**

**I. Type of Plan (check one box below)**

	Short-term Rehabilitation (Complete Parts A, B, C, and H only)
	Long-term Rehabilitation (Complete all parts)
√	Both Long and Short-term Rehabilitation (completed all parts)

**II. Type of Action (check one box below)**

√	Initial Submission
	Updating or Revising the Initial Submission
	Supplying Information for Accomplishment to Date on Work
	Different Phase of Project Plan
	Final Report (To Comply with the Closure of the EFR Account)

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**PART C            REHABILITATION ASSESSMENT**

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**I.            Rehabilitation Objectives:**

- !            Locate and stabilize severely burned slopes which pose a direct threat to human life, property or critically important cultural and natural resources.
- !            Recommend post-fire rehabilitation prescriptions which prevent irreversible loss of natural and cultural resources.
- !            As practical and necessary, restore natural conditions to areas disturbed by fire suppression actions.
- !            Conduct immediate post-burn reconnaissance for the fire suppression related impacts to threatened and endangered (T&E) species and cultural sites.
- !            Conduct immediate post-burn reconnaissance for fire and fire suppression related impacts to species and habitats identified for protection under the Presidential Proclamation 7319 establishing the Hanford Reach National Monument.
- !            Provide long-term monitoring recommendations intended to ensure the success of rehabilitation efforts.

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**PART D TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS**

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**I. BAER TEAM MEMBERS**

<b>POSITION</b>	<b>TEAM MEMBER / AGENCY</b>
Team Leader	Erv Gasser (NPS)
Public Information	Art Tasker (Washington Department of Natural Resources)
Operations	Chris Holbeck (NPS) Gavin Lovell (BLM)
NEPA Compliance & Planning	Richard Hadley (USFWS) Leslie Lew (USFWS)
Hydrologist	Judy Hallisey (USFS)
Soil Scientist	Norm Ambos (USFS)
Geologist	Marsha Davis (NPS) Becca Smith (NPS)
Cultural Resources/Archeologist	Mike Boynton (USFS)
Vegetation	Dave Smith (BIA)
Wildlife Biologist/TE Fauna	Karen Hayden (USFS)
GIS Specialists	John Price (BLM) Chris English (BIA) Bob Beckwith (BIA)
Documentation/Computer Specialists	Jay Lamberth (Consultant) Leslie Lew (USFWS)
Photographer	Kari Brown (Consultant)

**II. RESOURCE ADVISORS:** (Note: Resource Advisors are individuals who assisted the BAER Team with the preparation of this plan. See Part H of this plan for a full list of agencies and individuals who were consulted or otherwise contributed to the development of the plan.

AFFILIATION	NAME
Greg Hughes	USFWS, Hanford Reach National Monument, Project Leader
Jeff Haas	USFWS, Hanford Reach National Monument, Deputy Project Leader
Heidi Brunkal	USFWS, Hanford Reach National Monument, Wildlife Biologist
Paula Call	USFWS, Hanford Reach National Monument, Outdoor Recreation Planner
Cathy Criddle	USFWS, Hanford Reach National Monument, Information and Education Specialist
Thomas Skinner	USFWS, Hanford Reach National Monument, Fire Management Officer
Nick Valentine	USFWS, Region 1, Archeologist
Dana Ward	DOE, Hanford National Laboratory, Public Safety & Resource Protection Program, Environmental Scientist, Project Manager, Liaison
Bruce Bjornstad	Pacific Northwest National Laboratory, Geologist
Larry Caldwell	Pacific Northwest National Laboratory, Director of Research

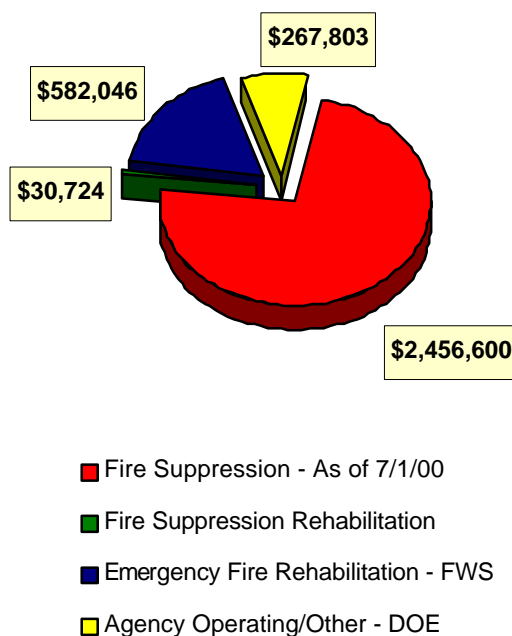
## PART E SUMMARY OF ACTIVITIES AND COST

The SUMMARY OF ACTIVITIES AND COST table identifies trackable rehabilitation costs charged or proposed for funding from fire suppression rehabilitation, emergency fire rehabilitation, emergency watershed protection, agency operations, and other funding sources. Only trackable expenditures are displayed in the total cost column. They are coded with the appropriate cost authority. The total cost of the rehabilitation effort to date, excluding the costs absorbed by the fire account (fire crews, labor, and associated overhead) is displayed as either Fire Suppression Rehabilitation(F), Emergency Fire Rehabilitation (EFR), Emergency Watershed Protection (EWP), or Agency Operations/Others (OP/O).

### 24 Command Fire

As of 7/7/00

FUNDING SUMMARY - ESTIMATED TOTAL \$ 3,337,173



PART E - SUMMARY OF ACTIVITIES - COST SUMMARY TABLE - 24									
COMMAND FIRE									
U.S. FISH AND WILDLIFE SERVICE									
PART E LINE ITEM	UNIT	UNIT COST	# OF UNITS	COST BY FUND SOURCE				IMPLEMENTATION METHOD	SPECIFICATION TOTAL
				FIRE	EFR	OP/O	EWP		
CULTURAL RESOURCES									
C-1a Cultural Resource Damage Assessment	Site	\$ 539.00	150		\$80,850			P, C	\$80,850
C-1b Cultural Resource Damage Assessment - Suppression	Miles	\$ 559.07	6	\$3,354				P	\$3,354
S-1A Public Safety: Protect Cultural Resources	Acres	0.17	76,406		\$12,989			P, C	\$12,989
NATURAL RESOURCES - VEGETATION									
N-1a Protection of T&E Species: Plant	Surveys	\$ 198.17	150			\$29,726		P	\$29,726
N-2 Non-native Invasive Plant Control	Acres	\$ 85.00	100		\$8,500			P, C	\$8,500
N-3a Ecological Stabilization: Sagebrush Plants	Plants	\$ 0.92	93,348		\$85,880			P, C	\$85,880
N-3a Ecological Stabilization: Sagebrush Outplanting	Acres	\$ 264.85	200		\$52,970			P, C	\$52,970
N-3c Ecological Stabilization: Seed Collection	Acres	\$ 8.52	800		\$6,816			P, C	\$6,816
M-1a Monitoring: Invasive Plant Species	Surveys	\$ 285.19	160		\$45,630			P	\$45,630
NATURAL RESOURCES - WILDLIFE									
N-1b Protection of T&E Species: Birds (Listed)	Surveys	\$ 1,775.00	41			\$72,775		P, C	\$72,775
S-1d Public Safety - Elk Monitoring	Months	\$ 6,236.00	12			\$74,832		P, C	\$74,832
SOIL & WATERSHED									
M-1b Monitoring: Microbiotic Soil Crust	Survey	\$ 13,450.00	1		\$13,450			P, C	\$13,450
OPERATIONS									
F-1 Hand line - Dozer line Rehab	Acre	\$ 2,150.00	1	\$2,150				C	\$2,150
F-3a Infrastructure Repair/Replace - Fence	Task	\$ 4,249.00	1	\$4,249				P	\$4,249
S-1c Public Safety: Ground Hazards	Fence	\$ 221.00	3		\$663			C	\$663
S-2a Road, Trail, and Safety Signs - DOE	Sign	\$ 3.67	1200		\$4,404			P	\$4,404
OTHER									
O-1 Implementation Leader	Project	\$ 38,700.00	1		\$38,700			P	\$38,700
O-2 BAER Team Consultations	Trip	\$ 6,120.00	1		\$6,120				\$6,120
TOTAL COST				\$9,753	\$356,972	\$177,333			\$544,059
COST: F=Suppression; EFR=Long-term Rehab.; OP=Base Funding; O=Other; EWP=Emergency Watershed Program METHOD: FC=Crew Assigned to Fire; C=Contract; EFC=Emergency Fire Contract; P=Agency Personnel									



**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>DAMAGE ASSESSMENTS FOR PREVIOUSLY DOCUMENTED CULTURAL RESOURCES</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>C-1a Cultural Resources Damage Assessment - Fire</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<p><b>I. General Description:</b> Within 60 days of control of the fire, complete a cultural resource field inventory and evaluation of previously recorded and documented sites within the area burned by the 24 Command Fire in order that each jurisdiction may develop a condition assessment for cultural resource compliance and rehabilitation purposes.</p> <p><b>II. Location (Suitable) Sites:</b> Approximately 190 sites (150 on FWS, 40 on DOE) are recorded within the burned area. Information specific to the location and description of cultural resources is sensitive and exempt from public disclosure under the Archaeological Resources Protection Act of 1979 and the Freedom of Information Act. The Department of Energy and US Fish and Wildlife Service maintain their own cultural resource records, and may issue detailed written descriptions of sites to be evaluated by field personnel, including site descriptions, GPS and/or TSR, and cross-referenced to agency maps.</p> <p><b>III. Design/Construction Specification (number and describe each task):</b></p> <ol style="list-style-type: none"> <li>1. Visit and evaluate each recorded site within the perimeter of the burned area and complete the optional form "24 Command Fire Emergency Post-Fire Site Inspection Record" (Appendix V). These evaluations should be completed within 60 days of the control of the fire, unless extended by the affected agency as authorized by a specific time waiver approved by NIFC.</li> <li>2. Site damage assessments should include post fire effects such as wind deflation, undercutting and loss of integrity, as well as wind-aided burial or erosion of surface features, increased visibility and vulnerability to looting.</li> <li>3. Develop mitigation, rehabilitation or monitoring recommendations, measures and cost estimates for each site that may be threatened by burial, destabilization, exposure to the public, or erosion consequent to fire effects.</li> <li>4. Initiate consultation with Tribal governments, Native American Indian communities and SHPO as required under 36 CFR 800.</li> <li>5. Implement the individual site treatments through a supplemental specification for Cultural Resources General Rehabilitation and Preservation Techniques for Sites.</li> </ol> <p><b>IV. Purpose of Treatment Specification:</b> This action is necessary to meet legislative mandates under Section 106 of the National Historic Preservation Act and 36 CFR 800.</p>
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**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
DOE Principal Investigator 2 days@\$1062/day	\$2,124

DOE Crew Chief 13 days @ \$850/day	\$11,050
DOE Crew 16 days @ \$400/day	\$6,400
DOE Tribal consulting, oral history, other consulting parties 10 days @ \$350/day	\$3,500
DOE Subtotal	\$23,070
FWS Principal Investigator 6 days @ \$1062/day	\$6,372
FWS Crew Chief 40 days @ \$850/day	\$34,000
FWS Crew 60 days @ \$400/day	\$24,000
FWS Tribal consulting, oral history, other consulting parties 30 days @ \$350/day	\$10,500
FWS Subtotal	\$74,872
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$97,942</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
DOE duplication of site records and files	\$2,500
FWS materials and supplies	\$2,000
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$4,500</b>
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

**SPECIFICATION COST SUMMARY**

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Site	\$539	190	\$102,442	EFR, OP/O	P, C
FY 2						
FY 3						
TOTAL	Site	\$539	190	\$102,442	EFR, OP/O	P, C

**FUNDING SOURCES:**

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	P, M
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services    **M** = Materials/Supplies    **T** = Travel    **C** = Contract    **F** = Suppression

**III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT**

List relevant documentation and cross-references within BAER Report: See Appendix I, Cultural Resource Assessment.
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**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
DOE	40	\$25,570
FWS	150	\$76,872
TOTAL COST	190	\$102,442







**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>INVENTORY AREAS IMPACTED BY FIRE SUPPRESSION ACTIVITIES FOR POTENTIAL DAMAGE TO CULTURAL RESOURCES</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>C-1b Cultural Resource Damage Assessment- Suppression</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<p><b>I. General Description:</b> Conduct a cultural resources field inventory of locations disturbed by the fire suppression effort, or with the potential to be impacted by rehabilitation activities, to identify cultural resource sites ( prehistoric, historic, traditional and cultural) that were or may be affected by these activities.</p> <p><b>II. Location (Suitable) Sites:</b> All dozer and hand line, staging areas, safety and deployment zones, helispots and other disturbed ground created by the fire suppression effort. All areas to be potentially affected by rehabilitation activities (e.g., mechanical seeding, erosion control structures, etc.). Maps of treatment areas may be found in Appendix III. Map locations of previously-recorded cultural resources are exempt from the Freedom of Information Act and are available to qualified personnel at the appropriate federal agency or from Tribal governments</p> <p><b>III. Design/Construction Specification (number and describe each task):</b> Conduct archaeological field inventory within areas disturbed by suppression activity or to be disturbed by rehabilitation work at a level commensurate with the Secretary of Interior's Standards and Guidelines (FR48, No. 190, September 29, 1983, 44716 – 44740) for field personnel and reporting standards.</p> <p>1. Consult with affected agencies, tribal governments and interested parties as required under 36 CFR 800.12(b)(2). Consulting parties are identified under Appendix II, Compliance Documentation.</p> <p>2. Undertake cultural resource field inventories. Do complete inventory of all suppression effects in the vicinity of recorded cultural resources. Due to the nature of the perimeter lines, conduct a sample inventory of approximately 25% of the dozer lines around the perimeter of the fire. Undertake additional dozer line inventory as determined by the results of the sample inventory.</p> <p>3. Complete damage assessment forms (See Appendix V, Cultural Resource Damage Assessment Form) and photo-document, map and GPS all cultural resources damaged by fire suppression activities, as well as those that may potentially be affected by rehabilitation activities.</p> <p>4. Prepare individual site treatment plans appropriate to the significance of the resource and level of disturbance or damage. Archaeological sites damaged by hand line, dozer line and other equipment use, staging areas and other suppression-related activity will require a complete evaluation and damage assessment. (See Appendix I, Cultural Resource Assessment, Rehabilitation Methodology)</p> <p>5. Consult with parties identified under (1) above, and submit a supplemental cultural resource treatment for implementation and completion of each damaged site within 60 days of control of the fire.</p> <p><b>IV. Purpose of Treatment Specification:</b> Identification, evaluation, protection and mitigation, as necessary, of adverse effects to cultural resources.</p>	
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**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
DOE Principal Investigator \$106/hr for 4 hrs	\$424
DOE Crew Chief \$85/hr for 52 hrs	\$1,700

DOE Crew \$40/hr for 40 hrs	\$1,600
DOE Tribal consultation/interviews \$350/day for 4 days	\$1,400
DOE Subtotal	\$5,124
FWS Principal Investigator \$106/hr for 2 hrs	\$212
FWS Crew Chief \$85/hr for 26 hrs	\$850
FWS Crew \$40/hr for 20 hours	\$800
FWS Tribal consultation/interviews \$350/day for 4 days	\$1,400
FWS Subtotal	\$3,262
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$8,386</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

**SPECIFICATION COST SUMMARY**

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Miles	\$559.07	15	\$8,386	F	P
TOTAL	Miles	\$559.07	15	\$8,386		



**FUNDING SOURCES:**

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	<b>F, C</b>
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

**III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT**

List relevant documentation and cross-references within BAER Report: See Appendix I, Cultural Resources Assessment.

**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
DOE	9	\$5,124
FWS	6	\$3,262
<b>TOTAL COST</b>	<b>15</b>	<b>\$8,386</b>







**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>ASSESS AND REHABILITATE DOZER LINE AND GRADED ROADS</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>F-1 Hand line - Dozer Line Rehab</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

- A. General Description:** Rehabilitation of suppression line is necessary to protect habitats from noxious weed infestation, visual intrusion on the landscape and to minimize fragmentation of ecological areas. Monitoring of suppression line rehab is necessary to determine the need for future exotic plant mitigation needs. Dozer lines within the burned area on lands managed by FWS and DOE will be treated according to methods described in the Hanford Site Biological Resource Management Plan (HSBRMP, 1996). Private lands to the west end of the fire will not be rehabilitated at the request of the private land owner. Dozer line along Hwy #225 will be treated in the same manner as HSBRMP Category 1 sites at the request of Bureau of Land Management and Washington Department of Fish and Wildlife. Soils are currently too powdery for immediate rehabilitation therefore treatments should be delayed until fall of 2000 until soil conditions and growing conditions are favorable to maximize success of rehabilitation actions.
- There are five types of suppression line to be considered:
- Graded Roads: Existing roads which were graded to act as suppression line.  
 Dozer Line on Private Lands: Dozer line built on private lands on the west end of the fire.  
 Dozer Line on State/BLM: Fire break built along Hwy #225.  
 HSBRMP Category 1: Fire break built on FWS or DOE lands in areas which require no restoration, but which may receive exotic plant mitigation.  
 HSBRMP Category 3: Dozer line built on FWS or DOE lands which requires rehabilitation.
- B. Location (Suitable) Sites:** Within the perimeter of the burned area. Refer to GIS data layer titled Suppression Impacts
- C. Design/Construction Specification (number and describe each task):**
- ☒ Graded Roads: Three road sections in the Snively springs area, off of road #118 require revegetation and noxious weed monitoring where a push berm was created as a result of the road being graded. Should noxious weeds be identified along the graded road edge, the application of herbicide, plant pulling or cultural remediation treatments should occur. See specification for noxious weed monitoring and native plant reseeding.
  - ☒ HSBRMP Category 1, Non-Habitat of Concern, and Dozer Line on State and BLM lands: Noxious weed monitoring should occur in these areas. If noxious weeds are identified along the fire breaks, the application of herbicide, plant pulling or cultural remediation treatments should occur in accordance with agency IPM practices. See specification for noxious weeds.
  - ☒ HSBRMP Category 3, Late -Successional Shrub-Steppe: Three areas identified on the Suppression Impacts GIS data layer require rehabilitation to a more natural condition. On DOE lands a four wheel drive tractor with a weighted drag or a ganno box attachment should drag the suppression lines and push berms to reduce the berm to contour. A drill seeder should apply native plant seed to meet HSBRMP specifications. If noxious weeds are identified along the dozer line, the application of herbicide, plant pulling or cultural remediation treatments should occur. On FWS lands a 20 person hand crew should pull the berm and rake the disturbed area to contour. Site selected plant material should be used to rehabilitate the disturbed area. See specification for native plant collection.
- D. Purpose of Treatment Specification:** Specification is intended to aid DOE and FWS staff in rehabilitating suppression lines within the fire area.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
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(FWS)20 man hand crew@ 3,000/day X 1/day X 1	\$3,000
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
(DOE)4x4 tractor with weighted drag @ \$200/hour X 16 X 1	\$3,200
(DOE)Drill seeder @ \$150/hour X 16 X 1	\$2,400
<b>TOTAL CONTRACT COST</b>	<b>\$5,600</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Acres	\$2,150	4	\$8,600	F	C
FY 2						
FY 3						
<b>TOTAL</b>	<b>Acres</b>	<b>\$2,150</b>	<b>4</b>	<b>\$8,600</b>	<b>F</b>	<b>C</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	<b>C</b>
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Operations Assessment, Appendix I. See fire suppression impacts map, Appendix III.
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### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
DOE	3 acres	\$6,450
FWS	1 acre	\$2,150
<b>TOTAL COST</b>	4 acres	<b>\$8,600</b>









**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>REPAIR FIRE SUPPRESSION DAMAGED FENCE</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>F-3a Infrastructure Repair/Replace - Fence</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	Fences around the perimeter of the fire and on Hwy #240 were cut to allow access by fire suppression vehicles. These fence cuts need to be repaired to protect these lands from trespass. Many of the fence cuts have been repaired along Hwy #240, but the potential for undocumented cut fence location exists. Agency staff should assess perimeter fence and make repairs as needed.
<b>II. Location (Suitable) Sites:</b>	All FWS/DOE lands located in the fire area.
<b>III. Design/Construction Specification (number and describe each task):</b>	Fence repairs shall be done in accordance with USFWS and DOE specifications.  1. Use agency personnel to survey perimeter fence and repair as needed.
<b>IV. Purpose of Treatment Specification:</b>	Specification is intended to aid DOE and FWS staff in securing the fenced perimeter of their associated lands within the fire area.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
(DOE/FWS)GS-9 @ \$200/day X 40 days X 1	\$8,000
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$8,000</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
(DOE/FWS)Fencing plyers @ \$15 X 4 X 1	\$60
Fence stretchers @ \$30 X 4 X 1	\$120
roll of smooth wire @ \$42 X 4 X 1	\$168

T-Posts @ \$3/each X 50 X 1	\$150
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$498</b>
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Yars = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Task	\$4,249	2	\$8,498	F	P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Task</b>	<b>\$4,249</b>	<b>2</b>	<b>\$8,498</b>	<b>F</b>	<b>P</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OPO** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>M</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Operations Assessment, Appendix I.  
See fire suppression impacts map, Appendix III

**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
DOE	1	\$4,249
FWS	1	\$4,249
<b>TOTAL COST</b>	2	<b>\$8,498</b>

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	REMOVE RETARDANT FROM LIGO TUNNEL WITH POWER WASHER	<b>JURISDICTIONS:</b>	DOE
<b>PART E LINE ITEM:</b>	F-3b Infrastructure Repair/Replace - LIGO	<b>FISCAL YEAR (list each year):</b>	2000

**I. WORK TO BE DONE**

<b>I.</b>	<b>General Description:</b> Remove retardant stain from LIGO tunnel with contract mobile power washer.
<b>II.</b>	<b>Location (Suitable) Sites:</b> LIGO facility located on DOE land north of Highway 240
<b>III.</b>	<b>Design/Construction Specification (number and describe each task):</b>  1. Remove the retardant from the LIGO south tunnel with an industrial mobile power washer.  2. Quality control will be monitored by DOE employees at the LIGO site and the contact will be Otto Mathermy.
<b>IV.</b>	<b>Purpose of Treatment Specification:</b> Specifications are intended to aid DOE in restoring the LIGO tunnels to a prefire condition.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Yars = Cost/Item):</b>	<b>COST/ITEM</b>

<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
mobile power washer @ \$700/day X 1 day X1	\$700
<b>TOTAL CONTRACT COST</b>	<b>\$700</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Task	\$700	1	\$700	F	C
FY 2						
FY 3						
<b>TOTAL</b>	<b>Task</b>	<b>\$700</b>	<b>1</b>	<b>\$700</b>	<b>F</b>	<b>C</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	<b>C</b>
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services **M** = Materials/Supplies **T** = Travel **C** = Contract **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Operations Assessment, Appendix I.

#### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
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DOE	1	\$700
<b>TOTAL COST</b>	1	<b>\$700</b>



**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>REMOVE BURNED DOE FIRE ENGINE FROM FWS LANDS</b>	<b>JURISDICTIONS:</b>	<b>DOE</b>
<b>PART E LINE ITEM:</b>	<b>F-5 Suppression Equipment Removal/Disposal</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I.</b>	<b>General Description:</b> A DOE type VI fire engine was burned over in the 24 Command fire. The vehicle is disabled and remains within the fire perimeter. The vehicle needs to be removed from FWS lands following the fire incident investigation. If soils under the engine are contaminated by fuels and oil, an amendment to this specification should be written to remediate those contaminated soils.
<b>II.</b>	<b>Location (Suitable) Sites:</b> The vehicle is located on a small ridge approximately 1.0 mile South of the point of origin of the fire. The disabled vehicle is located in Township 12 North, Range 24 East, Section #2, and the approximate Universal Transverse Mercator location is 5.158.713 north, by 287.943 east, zone 11. The vehicle is not on an established road and tow truck access is limited.
<b>III.</b>	<b>Design/Construction Specification (number and describe each task):</b>  <div style="margin-left: 20px;"> 1. Remove one disabled full-size pick-up truck. (Helicopter removal was considered but not thought to be cost effective due the proximity to a two track road)   2. A route of ingress and egress should be determined by U.S. Fish and Wildlife Service staff and be made part of the removal contract.   3. DOE will need to determine where the vehicle should be taken. Contact Jerry Keelin for information regarding this matter. </div>
<b>IV.</b>	<b>Purpose of Treatment Specification:</b> Specifications are intended to aid USFWS staff in the preparation of contract specifications and a scope of work for the removal of one disabled vehicle from ALE lands.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>

<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Yars = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
4x4 flatbed tow truck @ \$500/job X 1	\$500
<b>TOTAL CONTRACT COST</b>	\$500

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Task	\$500	1	\$500	F	C
FY 2						
FY 3						
<b>TOTAL</b>	<b>Task</b>	<b>\$500</b>	<b>1</b>	<b>\$500</b>	<b>F</b>	<b>C</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	<b>C</b>
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel      **C** = Contract      **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

<b>List relevant documentation and cross-references within BAER Report:</b> See Operations Assessment, Appendix I. See fire suppression impacts map, Appendix III.
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#### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
DOE	Task	\$500
TOTAL COST	Task	\$500

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>INVASIVE PLANT SPECIES MONITORING</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>M-1a Monitoring: Invasive Plant Species</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000, 2001</b>

**I. WORK TO BE DONE**

<b>A.</b>	<b>General Description:</b> Monitor vegetative recovery within the burned area in order to detect the invasion of invasive/noxious weeds on roads, dozerlines, handlines and other disturbed areas within the 24 Command fire area.
<b>B.</b>	<b>Location (Suitable) Sites:</b> Refer to Appendix III-Suppression Treatment Map and Noxious Weed Map for potential survey locations.
<b>C.</b>	<b>Design/Construction Specification (number and describe each task):</b>  Conduct short-term monitoring (2 years) on areas disturbed within the fire and on historic populations of known noxious weed populations to determine spread of invasive species and noxious weeds.  <input checked="" type="checkbox"/> Monitoring protocols will be established by each jurisdiction and will be implemented in accordance with current management plans.  <input checked="" type="checkbox"/> Photo-document and GPS new weed occurrences within disturbed lands.  <input checked="" type="checkbox"/> Initiate Agency approved control measures on new weed occurrences where monitoring demonstrates the establishment or expansion of known weed populations that threaten the natural regeneration of native vegetation or establishment of effective ground cover.  <input checked="" type="checkbox"/> Prepare final report of findings for submission to NIFC for inclusion in fire effects data base.
<b>D.</b>	<b>Purpose of Treatment Specification:</b> Protect the ecological integrity and site productivity of shrub-steppe plant communities within the ALE and DOE lands in accordance with established mission statements and management plan guidelines.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
USFWS- GS-9 Botanist/Vegetation Specialists x \$133/day X 16 weeks/year X 2 Fiscal Years	\$21,280
DOE- GS-9 Botanist/Vegetation Specialists x \$133/day X 16 weeks/year X 2 Fiscal Years	\$21,280
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$42,560</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
FWS- Film Purchase and processing 20 rolls X \$15 / roll	\$300
DOE- Film Purchase and processing 20 rolls X \$15 / roll	\$300

<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	<b>\$600</b>
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FWS- Rebar, Office Supplies (Paper, Disks, etc.)	\$200
DOE- Rebar, Office Supplies (Paper, Disks, etc.)	\$200
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$400</b>
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FWS -100 miles/day x 5 days per week x 16 weeks x .33/mile x 2 years	\$5,280
DOE -100 miles/day x 5 days per week x 16 weeks x .33/mile x 2 years	\$5,280
<b>TOTAL TRAVEL COST</b>	<b>\$10,560</b>
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Surveys	\$285.19	160	\$45,630	EFR, OP/O	P
FY 2	Surveys	\$285.19	160	\$45,630	EFR, OP/O	P
<b>TOTAL</b>	<b>Surveys</b>	<b>\$285.19</b>	<b>320</b>	<b>\$91,260</b>	<b>EFR, OP/O</b>	<b>P</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
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<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P, M, T</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Appendix III, Suppression Impacts and Noxious Weed Maps. Please refer to Vegetation Assessment, Appendix I.
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### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
USFWS	160	\$45,630
DOE	160	\$45,630
<b>TOTAL COST</b>	<b>320</b>	<b>\$91,260</b>

## U.S. DEPARTMENT OF THE INTERIOR BURNED AREA EMERGENCY REHABILITATION PLAN

### PART F - SPECIFICATIONS

SPECIFICATION TITLE:	INVENTORY MORTALITY AND MONITOR RECOVERY OF MICROBIOTIC SOIL CRUST	JURISDICTIONS:	DOE, FWS
PART E LINE ITEM:	M-1b Monitoring: Microbiotic Soil Crust	FISCAL YEAR (list each year):	2000, 2001

### I. WORK TO BE DONE

- I. General Description:** Inventory microbiotic soil crust (MSC) mortality and monitor recovery within the burn area to determine the degree and extent of mortality. The inventory and monitoring should be conducted during the first three years and the information made available to DOE/USFWS to determine whether or not mitigation action is necessary. Mitigation would be to inoculate dead zones with microbiotic soil specimens composed of similar species collected from an unburned area with the same soil types.
- II. Location (Suitable) Sites:** Monitoring plots should be placed randomly throughout the burn area as specified by the monitoring plan using appropriate existing plot locations and any identified new plots. The highest priority areas for monitoring and possible treatment are on Quincy (Rupert), Hezel, and Koehler soils which are the most prone to wind erosion.
- III. Design/Construction Specification (number and describe each task):**
1. Obtain the services of a specialist in MSC research to design a MSC mortality inventory study and monitoring plan.
  2. Implement the inventory and monitoring plan.
  3. Based on the results of the inventory, the management agencies will determine if mitigation is necessary and if so, to what degree and by what method. Any mitigation will be submitted as a supplemental funding request.
- IV. Purpose of Treatment Specification:** To stabilize soil types prone to wind erosion which can cause dust storms on downwind roads creating a public safety hazard. To determine the degree and extent of MSC mortality, natural recovery and need the to inoculate burn areas with microbiotic soil specimens. To increase knowledge and understanding of the effects of fire on MSC.

## II. LABOR, MATERIALS AND OTHER COST

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
DOE - GS-11/01 @ \$20.13/hr x 240 hrs x 1 year =	\$4,830
FWS - GS-11/01 @ \$20.13/hr x 240 hrs x 1 year =	\$4,830
DOE - GS-11/01 @ \$20.13/hr x 160 hrs x 1 year =	\$3,220
FWS - GS-11/01 @ \$20.13/hr x 160 hrs x 1 year =	\$3,220
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$16,100</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
DOE - Vehicle @ \$0.33/mi x 100 mi/day x 30 days x 1 year =	\$990
FWS - Vehicle @ \$0.33/mi x 100 mi/day x 30 days x 1 year =	\$990
DOE - Vehicle @ \$0.33/mi x 100 mi/day x 20 days x 1 year =	\$660
FWS - Vehicle @ \$0.33/mi x 100 mi/day x 20 days x 1 year =	\$660
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	<b>\$3,300</b>
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>

<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Yars = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
DOE - Design MSC mortality inventory and recovery monitoring plan	\$3,750
FWS - Design MSC mortality inventory and recovery monitoring plan	\$3,750
<b>TOTAL CONTRACT COST</b>	<b>\$7,500</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Plan	\$7,500	1	\$7,500	EFR, OP/O	P, C
FY 1	Survey	\$11,640	1	\$11,640	EFR, OP/O	P
FY 2	Survey	\$7,760	1	\$7,760	EFR, OP/O	P
<b>TOTAL</b>		<b>\$26,900</b>	<b>1</b>	<b>\$26,900</b>		

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT



List relevant documentation and cross-references within BAER Report: See Appendix I, Soil and Watershed Assessment.

#### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	1	\$13,450
DOE	1	\$13,450
<b>TOTAL COST</b>		<b>\$26,900</b>

### U.S. DEPARTMENT OF THE INTERIOR BURNED AREA EMERGENCY REHABILITATION PLAN

#### PART F - SPECIFICATIONS

<b>SPECIFICATION TITLE:</b>	THREATENED & ENDANGERED PLANT SPECIES MONITORING	<b>JURISDICTIONS:</b>	DOE, FWS
<b>PART E LINE ITEM:</b>	N-1a Protection of T&E Species: Plant	<b>FISCAL YEAR (list each year):</b>	2000, 2001

#### I. WORK TO BE DONE

- A. General Description:** Monitor six previously identified Threatened and Endangered (T&E) plant species to determine fire effects on these species and their post-fire recovery potentials.
- B. Location (Suitable) Sites:** Refer to Appendix III- T&E Plant Species map for potential survey locations.
- C. Design/Construction Specification (number and describe each task):**
- Conduct short-term monitoring (2 years) on known locations of *Astragalus columbianus*, *Cryptantha interrupta*, *Erigeron piperianus*, *Nicotiana attenuata*, and *Astragalus conjunctus var novum* within the fire area to determine fire effects on these species. Surveys should be conducted by both jurisdictions in a cooperative manner so that:
- ☒ Monitoring protocols will be established and will be implemented in accordance with current management plans.
  - ☒ Photo-document and GPS T&E plant species occurrences within the fire area.
  - ☒ Prepare final report of findings for submission to NIFC for inclusion in fire effects (FEIS) data base.
- D. Purpose of Treatment Specification:** Determine fire effects on known Federally and State listed T&E species of shrub-steppe plant communities within the ALE and DOE lands in accordance with established management plan guidelines. This treatment is consistent with DOI BAER policy for stabilization and prevention of unacceptable degradation of critical natural resources.

#### II. LABOR, MATERIALS AND OTHER COST

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item):</b> (Do not include contract personnel costs here - see contract services below).	<b>COST/ITEM</b>
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FWS-GS-11 Botanist/Vegetation Specialists x \$161/day X 12 weeks/year X 2 Fiscal Years	\$19,320
DOE-GS-11 Botanist/Vegetation Specialists x \$161/day X 12 weeks/year X 2 Fiscal Years	\$19,320
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$38,640</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
FWS-Film Purchase and processing 20 rolls X \$15 / roll	\$300
DOE-Film Purchase and processing 20 rolls X \$15 / roll	\$300
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	<b>\$600</b>
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FWS-Rebar, Office Supplies (Paper, Disks, etc.)	\$200
DOE -Rebar, Office Supplies (Paper, Disks, etc.)	\$200
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$400</b>
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FWS-100 miles/day x 5 days per week x 12 weeks x .33/mile x 2 years	\$3,960
DOE -100 miles/day x 5 days per week x 12 weeks x .33/mile x 2 years	\$3,960
<b>TOTAL TRAVEL COST</b>	<b>\$7,920</b>
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

**SPECIFICATION COST SUMMARY**

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Surveys	\$198.17	120	\$23,780	EFR, OP	P
FY 2	Surveys	\$198.17	120	\$23,780	EFR, OP	P
FY 3						
<b>TOTAL</b>	<b>Surveys</b>	<b>\$198.17</b>	<b>240</b>	<b>\$47,560</b>	<b>EFR, OP</b>	<b>P</b>

FUNDING SOURCES:

METHODS FOR COMPLETION:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P, M, T</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel      **C** = Contract      **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Appendix III, Suppression Impacts and Noxious Weed Maps. Please refer to Vegetation Assessment, Appendix I.
--

#### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	150	\$29,725
DOE	90	\$17,835
<b>TOTAL COST</b>	<b>240</b>	<b>\$47,560</b>

### U.S. DEPARTMENT OF THE INTERIOR BURNED AREA EMERGENCY REHABILITATION PLAN

#### PART F - SPECIFICATIONS

SPECIFICATION TITLE:	MONITOR FIRE EFFECTS TO SHRUB-STEPPE DEPENDENT AGENCY LISTED BIRD SPECIES	JURISDICTIONS:	FWS, DOE
PART E LINE ITEM:	N-1b Protection of T&E Species: Birds (Listed)	FISCAL YEAR (list each year):	2001, 2002, 2003

#### I. WORK TO BE DONE

- I. **General Description:** Monitor fire effects to Agency listed species: Ferruginous hawk, burrowing owl, loggerhead shrike, sage sparrow, sage thrasher, western sage grouse and long-billed curlew by determining post fire presence, reproductive status and reproductive success.
- II. **Location (Suitable) Sites:** Within the shrub-steppe vegetation type in and adjacent to the fire are, including all ALE and DOE lands (138,986 acres).
- III. **Design/Construction Specification (number and describe each task):**
1. Monitor Ferruginous hawk nests during the breeding season. Observer should go to each known nest location twice to determine presence and reproductive success. First visit is early in the breeding season after nest building has occurred: Observe if nest is occupied. Second visit is just before fledging to determine if young are in the nest (and how many if possible). As soon as possible after fire, determine presence and possible nest success of all nests known to be occupied before the fire. Subsequent surveys would begin in spring 2001. Minimize disturbance to birds utilizing standard techniques. COST BREAKDOWN: ALL ON DOE
  2. Monitor 2 known burrowing owl burrows. Observer should go to each known burrow three times, to determine presence and reproductive success. First visit is early in the breeding season: Observe if burrow is occupied. Second visit is during first three weeks after hatch to determine number of young. Third visit is just before fledging to determine how many young are at the burrow. As soon as possible after fire, determine presence and possible nest success of all nests known to be occupied before the fire. Subsequent surveys would begin in spring 2001. Minimize disturbance to birds utilizing standard techniques. COST BREAKDOWN: ALL ON FWS
  3. Monitor loggerhead shrike, sage sparrow, sage thrasher, western sage grouse and long-billed curlew. Point Count survey method at 33 previously established locations, once per month, as described in Birds of Fitzner-Eberhardt Arid Lands Ecology Reserve, 1998. Survey protocol, locations and previously collected data are on file at the ALNWR Office. Begin as soon as fire is declared out and continue through September 30 with one visit per month to each transect. Begin March 1 and go through September 30 of 2000. Add up to 6 additional point count survey routes to the DOE portion of this monitoring area. COST BREAKDOWN: 33 ON ALE AND 6 ON DOE.
  4. Monitor sage grouse reproductive behavior by conducting aerial lek surveys. Fixed wing or helicopter reconnaissance of the fire area should be done once a week during February and March, beginning in 2001, per protocol developed by Yakima Training Center (on file at ALNWR Office). Compare results with existing known nesting locations. COST BREAKDOWN: ALL ON FWS.
  5. Monitor presence of loggerhead shrike, sage sparrow, sage thrasher, western sage grouse and long-billed curlew by conducting transect surveys twice a month. Transect survey method for 5 locations is described in Birds of Fitzner-Eberhardt Arid Lands Ecology Reserve, 1998. Survey protocol, locations and previously collected data are on file at the ALNWR Office. Begin as soon as fire is declared out and continue for one year, visiting each transect once per month. At end of year compare results with previous years data and determine if another year of this type of monitoring is necessary to determine fire effects to these species. Add 2 additional transects to the DOE portion of this monitoring area. COST BREAKDOWN: 5 ON FWS AND 2 ON DOE.
- IV. **Purpose of Treatment Specification:** Because ALE was declared a National Monument to preserve and protect native shrub-steppe habitats and associated species, it is necessary to determine the effect of the fire on these agency listed sensitive species. Because the fire caused effects to about 64,244 acres of previously high quality brush-steppe habitat (greater than 85% plant mortality), and because the surrounding areas are not managed to maintain shrub-steppe habitats, the ALE and adjacent areas may not be suitable habitat for these species for several years. All of the species are identified by state, federal and local biologists as being rare within the Columbia Basin due to their dependence on a habitat which was high quality at the Hanford Site before the fire (due to no agriculture or other uses for 50 years). Now this habitat has been severely decreased. Information on presence and reproductive success of these species will be very important to determine the need for potential future conservation measures. Substantial data on all of these species has been collected prior to the fire. Post fire monitoring data will be compared to current information and analyzed to determine changes in use patterns, species presence and abundance, and reproductive success. This information will be used to determine fire affects and, if needed, to develop management strategies for habitat and species recovery. After the first year of data has been collected, analyzed and compared to previous years' results, determine if there is a need to continue this work, revise this monitoring specification and submit a supplemental request for funding modification.

## II. LABOR, MATERIALS AND OTHER COST

PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).	COST/ITEM
GS-9 @ \$16.56 per hour X 4 hours per week X 52 weeks per year to supervise project X 3 YEARS	\$10,332
<b>TOTAL PERSONNEL SERVICE COST</b>	\$10,332
EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).	COST/ITEM
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):	COST/ITEM
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):	COST/ITEM
<b>TOTAL TRAVEL COST</b>	
CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):	COST/ITEM
Ferruginous hawk nest surveys: 5@ 8 hour days (GS-9 wages) = \$662 + vehicle 60 miles per day @ \$.33 = \$19.80 + incidentals [binocs (400), spotting scope (400){ BINOCS AND SCOPE FIRST YEAR ONLY}, analysis supplies (50)] X 3 YEARS [ NO SITES ON FWS, 12 SITES ON DOE]	\$2,995
Burrowing owl: 5 days @ 8 hour days (GS-9 wages) = \$662 + vehicle 60 miles per day @ \$.33 = \$19.80 + incidentals: [tape recorder (100) and taped vocalizations (20){ RECORDER AND TAPE FIRST YEAR ONLY} + analysis supplies (50)] X 3 YEARS [2 SITES ON DOE; NO SITES ON ALE]	\$2,315
Point counts: 10 days per month for 7 months @ 8 hour days (GS-9 wages) = \$9,274 + vehicle 60 miles per day @ 8 days per month @ \$.33 per mile = \$1,109 + incidentals [analysis supplies (50)] X 3 YEARS [\$802.54 PER SITE; 33 SITES ON FWS AND 6 ON ALE]	\$31,299
Monitor sage grouse reprod. behavior 1 day per week for 8 weeks (GS-9) = \$1,060 + airplane @ \$200 per hour X3 hours per flight = \$4,800 + vehicle 20 miles per week @ \$.33 = \$53 + incidentals [analysis supplies \$50] X 3 YEARS [ALL ON ALE]	\$17,889
Transects: 4 days @ 8 hour days @ once per month (GS-9) = \$6,359 + vehicle 60 miles per day X 48 days @ \$.33 = \$950 + incidentals [analysis supplies \$50] X 3 YEARS [\$3,154 PER SITE; 5 SITES ON ALE AND 2 ON DOE]	\$22,077
<b>TOTAL CONTRACT COST</b>	\$76,575

### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Survey	\$29,583	1	\$29,583	EFR, OP/O	C, P
FY 2	Survey	\$28,663	1	\$28,663	EFR, OP/O	C, P

<b>FY 3</b>	<b>Survey</b>	<b>\$28,663</b>	<b>1</b>	<b>\$28,663</b>	<b>EFR, OP/O</b>	<b>C, P</b>
<b>TOTAL</b>		<b>\$86,908</b>		<b>\$86,906</b>		<b>\$86,908</b>

**FUNDING SOURCES:**

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel      **C** = Contract      **F** = Suppression

**III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT**

<b>List relevant documentation and cross-references within BAER Report:</b> See Appendix I, Wildlife Assessment. See Appendix III, Pre-Fire Shrub-Steppe Habitat for Agency Listed Species Map.
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**IV. TOTAL COST BY JURISDICTION**

<b>JURISDICTION</b>	<b>UNITS TREATED</b>	<b>COST</b>
FWS	41 SURVEY SITES + SUPERVISOR	\$72,790
DOE	20 SURVEY SITES	\$14,118
<b>TOTAL COST</b>	<b>61 SITES</b>	<b>\$86,908</b>







**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>NOXIOUS WEED CONTROL</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>N-2 Non-native Invasive Plant Control</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	Control noxious weed infestations remaining within 24 Command fire area prior to seed-set and maturation. Current weed species observed include Rush skeleton weed, knapweed (diffuse, spotted, russian), kochia and canadian thistle. Utilize integrated pest management techniques ( herbicides, biological, mechanical and cultural control methods) as appropriate to prevent the spread and establishment of noxious weeds within the fire area.
<b>II. Location (Suitable) Sites:</b>	Control all visible noxious weed populations along road systems within the fire area. Control sites identified include but are not limited to Rattlesnake Mountain roads, 1200 road, Rattlesnake Spring, Snively Canyon, 106, 117, and 118 gate roads. DOE control efforts should be conducted along all major road systems but in accordance with area closures and safety guidelines (see Appendix III, Noxious Weed Map).
<b>III. Design/Construction Specification (number and describe each task):</b>	<ol style="list-style-type: none"> <li>1. Control noxious weeds as identified in USFWS and DOE monitoring surveys prior to seed set in accordance with guidelines contained within ALE and DOE management plans and approved Environmental Assessments.</li> <li>2. Follow-up control in subsequent years on all new infestation sites as identified through noxious weed monitoring surveys.</li> </ol>
<b>IV. Purpose of Treatment Specification:</b>	Protect the ecological integrity and site productivity of shrub-steppe plant communities within the ALE and DOE lands in accordance with established management plan guidelines.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>

<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
FWS - Contract Weed Control 100 Acres @ \$85/Acre	\$8,500
DOE - Contract Weed Control- 50 Acres @ \$85/Acre	\$4,250
<b>TOTAL CONTRACT COST</b>	<b>\$12,750</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Acres	\$85	150	\$12,750	EFR, OP/O	P, C
FY 2						
FY 3						
<b>TOTAL</b>	<b>Acres</b>	<b>\$85</b>	<b>150</b>	<b>\$12,750</b>	<b>EFR, OP/O</b>	<b>P, C</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel      **C** = Contract      **F** = Suppression

III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Appendix III, Noxious Weed Map. See Appendix I, Vegetation Assessment.

IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	100	\$8,500
DOE	50	\$4,250
TOTAL COST	150	\$12,750

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>SAGEBRUSH PLANTATION REPLACEMENT</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>N-3a Ecological Stabilization - Sagebrush Plants</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	Replace sagebrush plantations ( <i>Artemisia spp.</i> ) lost during backfire operations on the 24 Command fire to protect ecological integrity of ALE and DOE lands.
<b>II. Location (Suitable) Sites:</b>	Sagebrush plantations were established in 1998 and 1999 along the Rattlesnake spring and Snively Canyon Road areas within the Arid Lands Ecology Refuge (ALE). Backfire operations conducted along US Highway 240 to stop fire progression onto Hanford lands resulted in the total loss of sagebrush plantations. Re-establishment of these plantations is necessary to achieve habitat management objectives for T&E species.
<b>III. Design/Construction Specification (number and describe each task):</b>	<ol style="list-style-type: none"> <li>1. Relocate boundaries of plantation sites. Utilize seed now in stock to grow container stock for outplanting in 2001 for the replacement of impacted plantations.</li> <li>2. Establish photo monitoring plots within each planting site and GPS boundaries of planting locations. Supervise planting and provide maintenance support.</li> <li>3. During the spring of 2002, conduct survival survey to determine success of outplantings. Determination of survival rate should be documented with findings incorporated into greenhouse growing operations, management guidelines for sage restoration, Agency protocols, and annual budget submissions.</li> </ol>
<b>IV. Purpose of Treatment Specification:</b>	Protect the ecological integrity and site productivity of shrub-steppe plant communities within the ALE and DOE lands in accordance with established management plan guidelines. Comply with directives established in USFWS BAER policy for the protection if ecosystem health, T&E species and Native American cultural values.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
FWS- GS-11 Botanist/Vegetation Specialist x \$161/day x 6 weeks x 1 year (planting design, Biological oversight)	\$4,830
DOE- GS-11 Botanist/Vegetation Specialist x \$161/day x 6 weeks x 1 year (planting design, Biological oversight)	\$4,830
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$9,660</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FWS- Sagebrush tubling stock @ \$.22/plant x 90,000 bare root plants	\$19,800

FWS- Sagebrush tubing stock @ \$.80/plant x 40,000 tublings	\$32,000
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$51,800</b>
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
FWS- Contract Planting Cost 65,000 plants x .45/plant	\$29,250
DOE- Contract Planting Cost 65,000 plants x .45/plant	\$29,250
<b>TOTAL CONTRACT COST</b>	<b>\$58,500</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Plants	\$.92	130,000	\$119,960	EFR, OP/O	C, P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Plants</b>	<b>\$.92</b>	<b>130,000</b>	<b>\$119,960</b>	<b>EFR, OP/O</b>	<b>C, P</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>P, M, C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: Appendix III- Fire Suppression Impacts Map. Please refer to Vegetation Assessment (Appendix I) for backfire operations description.

#### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	93,348	\$85,880
DOE	36,652	\$34,080
<b>TOTAL COST</b>	<b>130,000</b>	<b>\$119,960</b>

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>SAGEBRUSH OUTPLANTING</b>	<b>JURISDICTIONS:</b>	<b>FWS</b>
<b>PART E LINE ITEM:</b>	<b>N-3b Ecological Stabilization - Sagebrush Outplanting</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	In the fall of 2000, plant 80,000 sagebrush ( <i>Artemisia spp.</i> ) seedlings within the fire area to rehabilitate impacted shrub-steppe plant communities that serve as critical habitat for T&E species.
<b>II. Location (Suitable) Sites:</b>	Planting sites will be selected within the Arid Lands Ecology Refuge and DOE lands in historic sagebrush plant community sites. Planting sites will be chosen based upon habitat recovery needs, soil productivity, moisture regimes, and other native plant species post-fire recovery.
<b>III. Design/Construction Specification (number and describe each task):</b>	<ol style="list-style-type: none"> <li>1. Select planting locations in accordance with guidelines contained within ALE and DOE management plans and approved Environmental Assessments.</li> <li>2. Establish photo monitoring plots within each planting site and GPS boundaries of planting locations. Supervise planting and provide maintenance support.</li> <li>3. During the spring of 2001, conduct survival survey to determine success of outplantings. Determination of survival rate should be documented with findings incorporated into greenhouse growing operations, management guidelines for sage restoration, Agency protocols, and annual budget submissions.</li> </ol>
<b>IV. Purpose of Treatment Specification:</b>	Protect and restore the ecological integrity and site productivity of shrub-steppe sagebrush plant communities within the ALE and DOE lands in accordance with established management plan guidelines.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
GS-11 Botanist/Vegetation Specialist x \$166/day x 6 weeks x 1 year	\$4,980
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$4,980</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
Terra-Sorg GB, flagging, containers, hoses, truck rentals	\$3,000
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	<b>\$3,000</b>
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>

80,000 tubling seedlings @ \$.70/plant	\$56,000
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$56,000</b>
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
GOV- 100 miles per day x 30 days x .33/mile x 1 year	\$990
<b>TOTAL TRAVEL COST</b>	<b>\$990</b>
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
Planters- 80,000 plants x .55/plant	\$44,000
<b>TOTAL CONTRACT COST</b>	<b>\$44,000</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Acres	\$264.85	200	\$108,970	EFR	C,P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Acres</b>	<b>\$264.85</b>	<b>200</b>	<b>\$108,970</b>	<b>EFR</b>	<b>C, P</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OPO** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P, T</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel      **C** = Contract      **F** = Suppression



III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: Appendix III- Vegetation Map. Please refer to Vegetation Assessment (Appendix I) for complete justification.

IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	200	\$108,970
TOTAL COST	200	\$108,970

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>NATIVE SPECIES SEED COLLECTION AND PROCESSING</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>N-3c Ecological Stabilization - Seed Collection</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	Collect native seed from shrub-steppe plant communities remaining within the proximity of the 24 Command fire for the establishment of rehabilitation plant materials for rehabilitation treatments on suppression related impacts(backfire areas and dozer/fireline rehabilitation).
<b>II. Location (Suitable) Sites:</b>	Collect seed from native sagebrush, bitterbrush, bunchgrass and greasewood populations for the establishment of nursery stock for rehabilitation efforts within the 24 Command fire area. Collection sites may be within Hanford, Ale, or adjacent project lands.
<b>III. Design/Construction Specification (number and describe each task):</b>	<ol style="list-style-type: none"> <li>1. Identify collection sites within the project area for native seed collection.</li> <li>2. Develop collection protocols to ensure genetic quality and the protection of collection sites from over-harvest.</li> <li>3. Collect adequate seed in CY00 to meet long-term rehabilitation needs in years 2000-2002.</li> <li>4. Process and clean collected seed to obtain useable material for nursery growing operations.</li> </ol>
<b>IV. Purpose of Treatment Specification:</b>	Protect the ecological integrity and site productivity of shrub-steppe plant communities within the ALE and DOE lands in accordance with established management plan guidelines. Comply with directives established in USFWS BAER policy for the protection if ecosystem health, T&E species and Native American cultural values.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
FWS- GS-11 Botanist/Vegetation Specialist x \$161/day x 6 weeks x 1 year (species collection, Biological oversight)	\$4,830
DOE- GS-11 Botanist/Vegetation Specialist x \$161/day x 6 weeks x 1 year (species collection, Biological oversight)	\$4,830
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$9,660</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>

<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FWS- 100 Miles per day x 30 days x \$.33/mile	\$990
DOE- 100 Miles per day x 30 days x \$.33/mile	\$990
<b>TOTAL TRAVEL COST</b>	<b>\$1,980</b>
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
FWS- Seed Cleaning Costs (to produce 7 pounds of clean seed for 1600 Ac.)- 80 Hours x \$25/Hour	\$2,000
<b>TOTAL CONTRACT COST</b>	<b>\$2,000</b>

**SPECIFICATION COST SUMMARY**

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Acres	\$8.52	1,600	\$13,640	EFR, OP/O	C, P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Acres</b>	<b>\$8.52</b>	<b>1,600</b>	<b>\$13,640</b>	<b>EFR, OP/O</b>	<b>C, P</b>

**FUNDING SOURCES:**

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P, T</b>

<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	
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P = Personnel Services      M = Materials/Supplies      T = Travel      C = Contract      F = Suppression

### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

<p><b>List relevant documentation and cross-references within BAER Report:</b> See Appendix III, Fire Suppression Impacts Map. Please refer to Vegetation Assessment for backfire operations description, Appendix I.</p>
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### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	800	\$6,820
DOE	800	\$6,820
<b>TOTAL COST</b>	<b>1,600</b>	<b>\$13,640</b>

## U.S. DEPARTMENT OF THE INTERIOR BURNED AREA EMERGENCY REHABILITATION PLAN

### PART F - SPECIFICATIONS

<b>SPECIFICATION TITLE:</b>	<b>BAER IMPLEMENTATION LEADER &amp; ADMINISTRATIVE SUPPORT</b>	<b>JURISDICTIONS:</b>	<b>DOE, FWS</b>
<b>PART E LINE ITEM:</b>	<b>O-1 Implementation Leader</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000-2001</b>

### I. WORK TO BE DONE

<p><b>I. General Description:</b> Hire a project implementation leader and administrative support position to coordinate and oversee the implementation of the 24 Command Fire BAER Plan on both U.S. Department of Energy and U.S. Fish and Wildlife Service administered lands. This specification provides funding for one year. A supplemental funding request to extend the position can be submitted after one year if necessary.</p> <p><b>II. Location (Suitable) Sites:</b> Treatment areas are distributed throughout the burned area. Duty station will be at the local headquarters for the agencies in Richland, Washington.</p> <p><b>III. Design/Construction Specification (number and describe each task):</b> The Project Implementation Leader is responsible for the over-site of the BAER Plan implementation for the jurisdictions for which they were hired. The Leader will coordinate with each of the involved agencies on cross jurisdictional projects to achieve efficient use of funds, personnel, equipment, and contracts. The Leader specifically will oversee implementation, monitoring, program review, proposed plan revisions, and supplemental funding requests. The Leader completes annual accomplishment reports. The administrative support position will assist implementation leader and tracks EFR budgets.</p> <p><b>IV. Purpose of Treatment Specification:</b> The purpose is to provide quality control over project implementation and to ensure a comprehensive plan implementation.</p>
--

### II. LABOR, MATERIALS AND OTHER COST

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
GS-11 @ \$39,178 / year X 1 year	\$41,634
GS-7 @ \$22,560 / year X 1 year	\$28,266

<b>TOTAL PERSONNEL SERVICE COST</b>	\$69,900
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
½ Ton GSA Pickup Rental	\$5,000
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	\$5,000
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
Administrative materials	\$2,500
<b>TOTAL MATERIALS AND SUPPLY COST</b>	\$2,500
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Project	\$77,400	1	\$77,400	EFR, OP/O	P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Project</b>	<b>\$77,400</b>	<b>1</b>	<b>\$77,400</b>	<b>EFR, OP/O</b>	<b>P</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>M</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	

<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Executive Summary
---

### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
DOE	1	\$38,700
FWS	1	\$38,700
<b>TOTAL</b>	<b>2</b>	<b>\$77,400</b>

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>FOLLOW-UP BAER TEAM CONSULTATION</b>	<b>JURISDICTIONS:</b>	<b>FWS</b>
<b>PART E LINE ITEM:</b>	<b>O-2 BAER Team Consultations</b>	<b>FISCAL YEAR (list each year):</b>	<b>2001</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	This specification will provide funding for costs associated with additional BAER Team consultations during implementation of the 24 Command Fire.
<b>II. Location (Suitable) Sites:</b>	Travel from home units to the Arid Lands National Wildlife Refuge Complex, Richland, Washington.
<b>III. Design/Construction Specification (number and describe each task):</b>	Fund round trip travel costs for three BAER Team members from home units to the Arid Lands National Wildlife Refuge Complex during fiscal years 2001 or 2002.
<b>IV. Purpose of Treatment Specification:</b>	Local agency staff may require additional advise and technical support during the three year implementation period for the 24 Command Fire BAER Plan. The specification will provide the funds for this consultation.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
GS-12 @ \$26.00 / hour X 40 hours X 3 individuals =	\$3,120
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$3,120</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Yars = Cost/Item):</b>	<b>COST/ITEM</b>
Round Trip Travel costs @ \$1,000 X 3 trips =	\$3,000
<b>TOTAL TRAVEL COST</b>	<b>\$3,000</b>
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>

TOTAL CONTRACT COST	



**SPECIFICATION COST SUMMARY**

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1						
FY 2	Trip	\$6,120	1	\$6,120	EFR	P
FY 3						
<b>TOTAL</b>	<b>Trip</b>	<b>\$6,120</b>	<b>1</b>	<b>\$6,120</b>	<b>EFR</b>	<b>P</b>

**FUNDING SOURCES:**

F = Fire Suppression Account  
EFR = Emergency Fire Rehabilitation  
OP/O = Agency Operating/Other  
EWP = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

P = Agency Personnel Services  
C = Contract (long-term)  
EFC = Emergency Fire Contract  
FC = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	<b>T</b>
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services      M = Materials/Supplies      T = Travel      C = Contract      F = Suppression

**III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT**

List relevant documentation and cross-references within BAER Report: See Executive Summary
---

**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
FWS	3 Round Trips (personnel & travel cost)	\$6,120
<b>TOTAL COST</b>	3 Round Trips (personnel & travel cost)	\$6,120



**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>LAW ENFORCEMENT MONITORING OF CULTURAL RESOURCES EXPOSED BY FIRE</b>	<b>JURISDICTIONS:</b>	<b>FWS</b>
<b>PART E LINE ITEM:</b>	<b>S-1a Public Safety: Protect Cultural Resources</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000, 2001</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	Patrol selected historic and prehistoric archaeological sites and localities to monitor site looting and vandalism. Take action on artifact collectors and looters.
<b>II. Location (Suitable) Sites:</b>	Sensitive cultural resource locations are exempt from disclosure under the Freedom of Information Act. Site locations will be maintained by the appropriate jurisdictions and the law enforcement officers.
<b>III. Design/Construction Specification (number and describe each task):</b>	<ol style="list-style-type: none"> <li>1. Coordinate law enforcement patrols and actions with Agency archaeologists and cultural resource personnel.</li> <li>2. Undertake random patrols, make contact as appropriate, and take action against violators.</li> <li>3. Consult with Tribal governments and cultural resource programs regarding law enforcement patrols.</li> </ol>
<b>IV. Purpose of Treatment Specification:</b>	To protect exposed sensitive historic and prehistoric cultural resources and deter looters. This will be a temporary measure until sufficient green-up occurs to conceal some cultural materials, and until field inventory and assessment work is completed.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
GS 9 LEO @ \$225 per day for 40 days	\$9,000
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$9,000</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>

<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Tips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
FOR of \$300/mo for 2 months	\$600
Mileage at \$.35/mile @ 10,000 miles	\$3,500
<b>TOTAL TRAVEL COST</b>	<b>\$4,100</b>
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Acre	\$.14	76,406	\$10,480	EFR	P
FY 2	Acre	\$.03	76,406	\$2,620	EFR	P
FY 3						
<b>TOTAL</b>		<b>\$.17</b>		<b>\$13,100</b>		

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P, T</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services    **M** = Materials/Supplies    **T** = Travel    **C** = Contract    **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Appendix I, Cultural Resource Assessment.

**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
FWS	76,406	\$13,100
TOTAL COST	76,406	\$13,100

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>INSTALL DRIFT FENCING</b>	<b>JURISDICTIONS:</b>	<b>DOE</b>
<b>PART E LINE ITEM:</b>	<b>S-1b Public Safety: Drift Fencing</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	Purchase and install drift fences along Route 4 South and Route 2 South on DOE lands to prevent sand from accumulating on the roadways as a result of increased sand movement caused by the 24 Command Fire.
<b>II. Location (Suitable) Sites:</b>	Along the southwest side of Route 4 South from the Wye Barricade eight miles to the northwest and along the west side of Route 2 South from the Wye Barricade one mile south. See attached map.
<b>III. Design/Construction Specification (number and describe each task):</b>	1. Install drift fences as per WaDOT standards.
<b>IV. Purpose of Treatment Specification:</b>	To prevent sand from accumulating on the roadways causing a potential public safety hazard.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
950 rolls (50' rolls) of drift fence @ \$60	\$57,000
<b>TOTAL MATERIALS AND SUPPLY COST</b>	\$57,000
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>

<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
Installation of drift fence	\$8,550
<b>TOTAL CONTRACT COST</b>	<b>\$8,550</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Mile	\$7,283.33	9	\$65,550	OP/O	C
FY 2						
FY 3						
<b>TOTAL</b>	<b>Mile</b>	<b>\$7,283.33</b>	<b>9</b>	<b>\$65,550</b>	<b>OP/O</b>	<b>C</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services    **M** = Materials/Supplies    **T** = Travel    **C** = Contract    **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Appendix I, Soil and Watershed Assessment. See attached location map.
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IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
DOE	9	\$65,550
TOTAL COST	9	\$65,550



**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>MITIGATE MINE SHAFT HAZARD WITH SAFETY FENCE AND HAZARD SIGN</b>	<b>JURISDICTIONS:</b>	<b>FWS</b>
<b>PART E LINE ITEM:</b>	<b>S-1c Public Safety: Ground Hazards</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I. General Description:</b>	During reconnaissance flights BAER staff observed an open shaft in the vicinity of the fire origin and two cone shaped concrete hole openings at the NIKE Missile site. The open shaft is six feet by six feet square, and is 15 to 20 feet deep the 2 concrete holes are six feet in diameter and twenty feet deep . The reduction in vegetative cover associated with the fire has made these hazards more visible. FWS staff and agency researchers accessing the burned area will be exposed to falling hazards due to these openings. The shaft should be made safe by the application of a wire fence and warning signs. Fencing is not a long term solution to the mine safety issue at this mine site. Following biological and cultural resource assessments, a long term solution like back-filling, or the application of a Polyurethane Foam plug should be considered by staff.
<b>II. Location (Suitable) Sites:</b>	The shaft is located in Township 12 north, Range 24 east, section #2. The site is located approximate at Universal Transverse Mercator 5.158.713 north, 287.943 east, zone 11. The two concrete holes are located near the NIKE Missile site ( see the suppression impacts maps)
<b>III. Design/Construction Specification (number and describe each task):</b>	Install four sided fence around the openings with warning signs using "T" posts and one role of smooth wire.
<b>IV. Purpose of Treatment Specification:</b>	Specification is intended to protect FWS staff and researchers from falling hazards.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
GS-5 @ \$125/day X one person X three days X 1 =	\$375
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
T-posts @ \$4 per post X 12 X 1	\$48
Hazard signs @ \$10 per sign X 12 X 1	\$120
Smooth wire @ \$60 per role X two rolls X 1	\$120

<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$288</b>
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
<b>TOTAL CONTRACT COST</b>	

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Fence	\$221	3	\$663	EFR	P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Fence</b>	<b>\$221</b>	<b>3</b>	<b>\$663</b>	<b>EFR</b>	<b>P</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>M</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

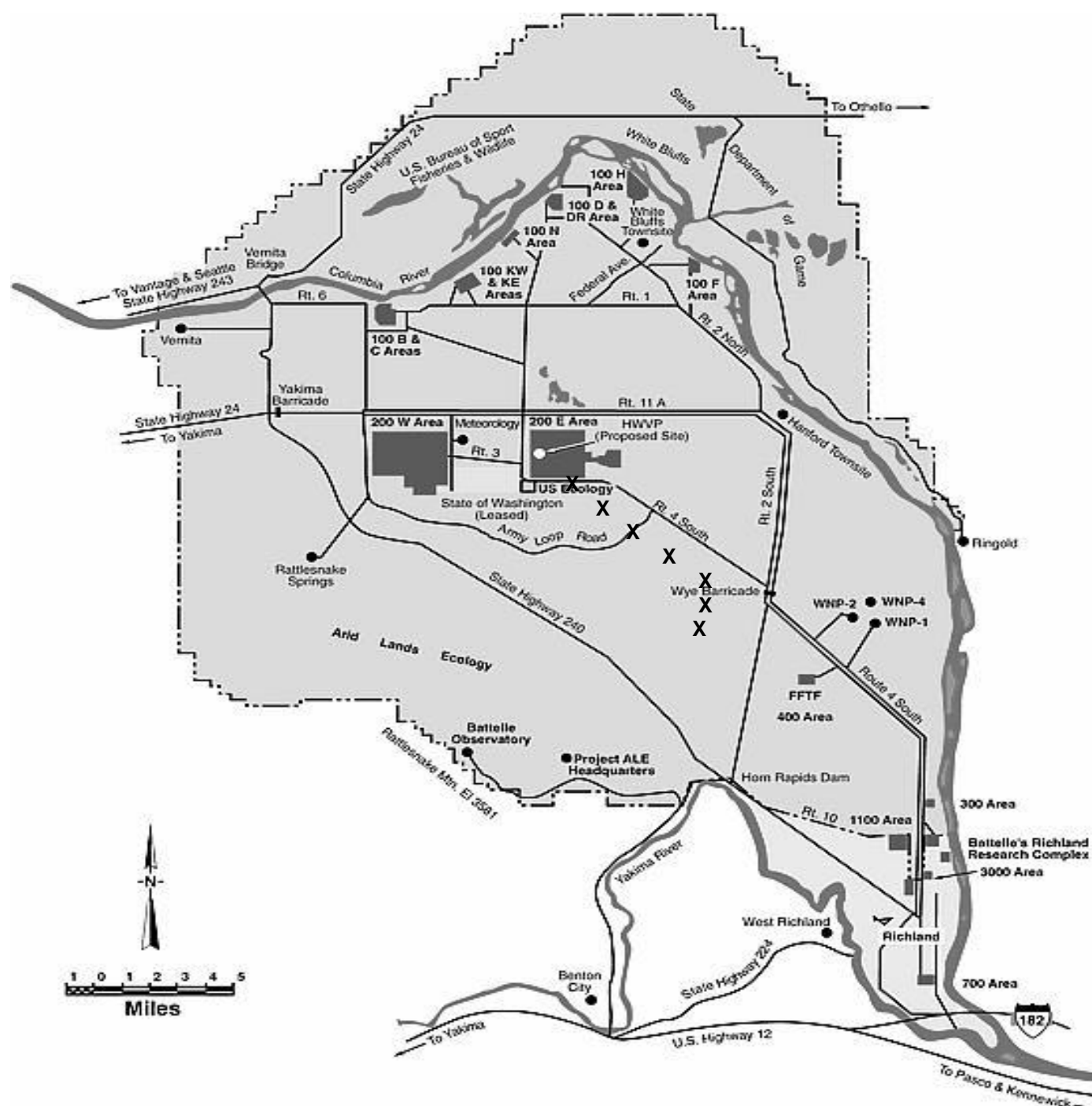
**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel **C** = Contract      **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

**List relevant documentation and cross-references within BAER Report:** See Operations Assessment, Appendix I.  
 See fire suppression impacts map, Appendix III.

IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
FWS	3	\$663
TOTAL COST	3	\$663



XXXXXXX - Drift Fence Location

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>MONITOR ELK TO DETERMINE FIRE EFFECTS</b>	<b>JURISDICTIONS:</b>	<b>FWS</b>
<b>PART E LINE ITEM:</b>	<b>S-1d Public Safety: Elk Monitoring</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000, 2001</b>

**I. WORK TO BE DONE**

- I. General Description:** Monitor locations and movement patterns of elk to determine habitat use within and adjacent to the fire area, and locations of road crossings.
- II. Location (Suitable) Sites:** Within and adjacent to the fire area. Sites to be determined by Elk Monitoring Project Leader.
- III. Design/Construction Specification (number and describe each task):**
  1. Design statistically robust sampling scheme to determine elk habitat use and movement patterns.
  2. Track radio collared elk (25 animals) two times a week for the next 12 months, beginning immediately. Decrease sampling intensity to once per week as vegetation grows during the rainy season to reflect expectation of less movement after forage becomes more readily available. Once per week would be aerial (addresses issue of access to private land); once per week would be ground, 8 hour search. Need to continue for full seasonal cycle to determine if/when elk return to normal use patterns as documented in previously conducted monitoring project. Would then determine if additional years are needed and submit supplemental requests for funding.
  3. Observe elk movement across highway corridors at strategic locations (to be determined by project leader during first few weeks of project) during dawn and dusk 4 times a week for the first 4 months. 2 hours per each monitoring period; 4 hours total per day; monitoring period would be one hour before sunrise to one hour after and one hour before sunset to one hour after. This sampling intensity can be decreased if it is determined that elk movement patterns across the highways have been well enough documented. This portion of the monitoring may not be needed in the second and third years.
  4. Actions that might be taken as a result of the monitoring: Data collected will be assessed and compared with previous years data, as well as with literature available on similar situations elsewhere in elk range. This information will then be added to the elk management plan which is currently being developed. Potential agency actions might include (per discussions with various agency reps as listed in BAER Wildlife Report): Install offsite water troughs outside of key riparian areas, removal of elk, fencing of riparian area, pay dividends to private land owners, supplemental feeding of elk on State lands; drift fences along highways at Elk crossings to redirect to less critical sites; Elk fencing around sensitive DOE facilities.
- IV. Purpose of Treatment Specification:** To determine changes in elk distribution within and adjacent to the fire area because of: 1) Public safety - frequency of deer & elk crossing Hwy 240 and 225 is expected to increase due to loss of forage within the fire area; motorists should be kept informed to minimize risk. 2) Private landowner concern that elk degradation of economically important agricultural crops may increase due to the fire. 3) Potential for elk to affect fragile natural resources on the ALE including cryptogamic crust, riparian areas and recovering brush species. 4) Tribal concern that elk may cause impacts to culturally significant sites and plants within and adjacent to the fire area.
 

Monitoring results would be compared with existing pre-fire data and analyzed to develop management strategies which address anticipated effects to these various resources. Substantial data on elk and deer herds in this area has been collected since 1983.

NOTE: Costs are not divided by agency because it would be inefficient to separate monitoring work on a species which ignores administrative boundaries. In addition, it is not known at this time if the elk use patterns will cause them to be found more frequently on ALE or DOE lands. It is thought that the existing MOU between ALE and DOE will suffice to allow for this monitoring to go forth as a single project, funded by EFR.

## II. LABOR, MATERIALS AND OTHER COST

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
GS-9 @ 16.56 per hour X 40 hours per week x one year	\$34,575
GS-11 @ \$20.04 per hour X 4 hours per week X one year plus first year develop sampling scheme 2 weeks (\$1,603	\$5,771
<b>TOTAL PERSONNEL SERVICE COST</b>	<b>\$40,346</b>
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
GSA rig for half of year, including gas	\$2,000
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	<b>\$2,000</b>
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
binoculars ALL OF THESE ARE FIRST YEAR EXPENSES ONLY	\$400
flight suit	\$80
flight helmet	\$200
transceiver	\$500
antennae	\$100
<b>TOTAL MATERIALS AND SUPPLY COST</b>	<b>\$1,280</b>
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
none; no travel off site. Travel to work location included in personnel time above.	
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>
Airplane and pilot @ \$200 per hour x 3 hours per week for 52 weeks	\$31,200
<b>TOTAL CONTRACT COST</b>	<b>\$31,200</b>

### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
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FY 1	month	\$6,236	3	\$18,708	EFR	p
FY 2	month	\$6,236	9	\$56,124	EFR	P
<b>TOTAL</b>			<b>12</b>	<b>\$74,826</b>		

**FUNDING SOURCES:**

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>C, T</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	<b>P, M</b>
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services      **M** = Materials/Supplies      **T** = Travel      **C** = Contract      **F** = Suppression

**III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT**

List relevant documentation and cross-references within BAER Report: See Appendix I, Wildlife Assessment
--

**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
FWS	12	\$74,826
<b>TOTAL COST</b>		<b>\$74,826</b>





**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	REPLACE DOE NO TRESPASS SIGNS	<b>JURISDICTIONS:</b>	DOE
<b>PART E LINE ITEM:</b>	S-2a Road, Trail, and Safety Signs - DOE	<b>FISCAL YEAR (list each year):</b>	2000

**I. WORK TO BE DONE**

<b>I. General Description:</b> Replace plastic no trespass signs on boundary fence to keep public out of restricted DOE properties. Areas are closed for public safety and security.
<b>II. Location (Suitable) Sites:</b> Boundary fence along public access roads within the burned area.
<b>III. Design/Construction Specification (number and describe each task):</b> Attach replacement signs to existing fence line at 1/8 of mile interval. Signs are standard DOE No Trespassing Sign to be ordered through existing DOE vendor.
<b>IV. Purpose of Treatment Specification:</b> To keep public out of secured areas for public safety.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item):</b> (Do not include contract personnel costs here - see contract services below).	<b>COST/ITEM</b>
GS-5 @ \$11,50 / hour X 40 hours X 2 positions =	\$920
<b>TOTAL PERSONNEL SERVICE COST</b>	\$920
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X # Fiscal Years = Cost/Item):</b> (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
1,200 signs @ \$2.60 / each =	\$3,120
<b>TOTAL MATERIALS AND SUPPLY COST</b>	\$3,120
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	
<b>CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):</b>	<b>COST/ITEM</b>

TOTAL CONTRACT COST	

**SPECIFICATION COST SUMMARY**

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Sign	\$3.67	1,200	\$4,040	F	P
FY 2						
FY 3						
<b>TOTAL</b>	<b>Sign</b>	<b>\$3.67</b>	<b>1,200</b>	<b>\$4,040</b>		

**FUNDING SOURCES:**

F = Fire Suppression Account  
 EFR = Emergency Fire Rehabilitation  
 OP/O = Agency Operating/Other  
 EWP = Emergency Watershed Protection

**METHODS FOR COMPLETION:**

P = Agency Personnel Services  
 C = Contract (long-term)  
 EFC = Emergency Fire Contract  
 FC = Crew Labor Assigned to Fire

**SOURCE OF COST ESTIMATE**

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	P, M
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services      M = Materials/Supplies      T = Travel      C = Contract      F = Suppression

**III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT**

List relevant documentation and cross-references within BAER Report: Contact Mark Farver (509) 373-0945 with DOE to coordinate this treatment.
--

**IV. TOTAL COST BY JURISDICTION**

JURISDICTION	UNITS TREATED	COST
DOE	1,200 signs	\$4,040
<b>TOTAL COST</b>	<b>1,200 signs</b>	<b>\$4,040</b>



**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION PLAN**

**PART F - SPECIFICATIONS**

<b>SPECIFICATION TITLE:</b>	<b>ELK HAZARD WARNING SIGNS</b>	<b>JURISDICTIONS:</b>	<b>DOE</b>
<b>PART E LINE ITEM:</b>	<b>S-2b Road, Trail and Safety Signs - Elk</b>	<b>FISCAL YEAR (list each year):</b>	<b>2000</b>

**I. WORK TO BE DONE**

<b>I.</b>	<b>General Description:</b> Construct and install elk crossing signs at locations with increased elk activity along highways 240 and 225 as a result of the 24 Command Fire.
<b>II.</b>	<b>Location (Suitable) Sites:</b> Four new signs (in addition to the ones that are already in service) will be placed along highway 240, and two new signs will be placed along highway 225 within and on the edges of the anticipated migration areas of the elk as they roam within and outside of the burn area crossing roads and highways in or near the burn area.
<b>III.</b>	<b>Design/Construction Specification (number and describe each task):</b>  <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Signs will be 36" diamond shaped, reflective, black on yellow, with a picture of an elk on them. WaDOT refers to these signs as W11-3. Signs will be produced and installed by WaDOT.         </div>
<b>IV.</b>	<b>Purpose of Treatment Specification:</b> To provide warning to motorists about potential public safety hazards caused by elk crossing roads.

**II. LABOR, MATERIALS AND OTHER COST**

<b>PERSONAL SERVICES (Grade @ Cost/Hour x # Hours X Fiscal Years = Cost/Item): (Do not include contract personnel costs here - see contract services below).</b>	<b>COST/ITEM</b>
<b>TOTAL PERSONNEL SERVICE COST</b>	
<b>EQUIPMENT PURCHASE, LEASE OR RENTAL (Item @ Cost/Hour or Day X # Hours or Days X Fiscal Years = Cost/Item): (Note: Purchase requires written justification that demonstrates cost benefits over lease or rental).</b>	<b>COST/ITEM</b>
<b>TOTAL EQUIPMENT PURCHASE, LEASE, OR RENTAL COST</b>	
<b>MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL MATERIALS AND SUPPLY COST</b>	
<b>TRAVEL COST (Personnel @ Rate X Round Trips X Fiscal Years = Cost/Item):</b>	<b>COST/ITEM</b>
<b>TOTAL TRAVEL COST</b>	

CONTRACT COST (Labor, Equipment, and Travel @ Cost/Hour X # Hours X Fiscal Years = Cost Item):	COST/ITEM
6 elk crossing warning signs @ \$300 each =	\$1,800
<b>TOTAL CONTRACT COST</b>	<b>\$1,800</b>

#### SPECIFICATION COST SUMMARY

FISCAL YEAR	UNIT	UNIT COST	# OF UNITS	COST	FUNDING SOURCE	METHOD
FY 1	Sign	\$300	6	\$1,800	EFR	C
FY 2						
FY 3						
<b>TOTAL</b>	<b>Sign</b>	<b>\$300</b>	<b>6</b>	<b>\$1,800</b>	<b>EFR</b>	<b>C</b>

#### FUNDING SOURCES:

**F** = Fire Suppression Account  
**EFR** = Emergency Fire Rehabilitation  
**OP/O** = Agency Operating/Other  
**EWP** = Emergency Watershed Protection

#### METHODS FOR COMPLETION:

**P** = Agency Personnel Services  
**C** = Contract (long-term)  
**EFC** = Emergency Fire Contract  
**FC** = Crew Labor Assigned to Fire

#### SOURCE OF COST ESTIMATE

<input checked="" type="checkbox"/> Estimate obtained from 2 - 3 independent contractual sources	
<input checked="" type="checkbox"/> Documented cost figures from similar project work obtained from local agency sources.	<b>M, C</b>
<input checked="" type="checkbox"/> Estimate supported by cost guides from independent sources or other federal agencies.	
<input checked="" type="checkbox"/> Estimate based upon government wage rates and materials cost.	
<input checked="" type="checkbox"/> No cost estimate required - cost charged to Fire Suppression Account	

**P** = Personnel Services    **M** = Materials/Supplies    **T** = Travel    **C** = Contract    **F** = Suppression

#### III. RELEVANT DETAILS, MAPS, AND DOCUMENTATION INCLUDED IN REPORT

List relevant documentation and cross-references within BAER Report: See Appendix I, Watershed Assessment.
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#### IV. TOTAL COST BY JURISDICTION

JURISDICTION	UNITS TREATED	COST
DOE	6	\$1,800

TOTAL COST	6	\$1,800
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**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**PART G      POST-REHABILITATION RECOMMENDATIONS**

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**I.    Long-term Monitoring:**

- !      Cultural Resources
- !      Vegetative Recovery
- !      Noxious Weeds
- !      Riparian and Spring Vegetation Recovery
- !      Threatened and Endangered Species
- !      Post-fire Elk Distribution
- !      Post-fire Sage Grouse Distribution
- !      Sensitive Small Mammals
- !      Sensitive Avian Species





**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**PART H      CONSULTATIONS**

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**U.S. Fish and Wildlife Service**

Fred Paveglio, Regional Refuge Wildlife Biologist  
Kevin Kilbride, Wildlife Biologist  
Gary Kemp, Mid-Columbia Complex, Prescribed Fire Specialist  
Jeff Jauschneg, Law Enforcement, Hanford Reach National Monument  
Dennis Carlson

**National Marine Fisheries Service**

Dale Bambrick

**Department of Energy**

Keith Klein, Manager, Hanford National Laboratory  
Mike Thompson, Groundwater Program, Manager and Chief Hydrologist  
Jerry Keelin, Department of Energy  
Otto, Matherly, LIGO  
Kevin Clark

**Confederated Tribes of the Umatilla Indian Reservation**

J.R. Wilkinson, Dept. of Natural Resources, Special Services and Rscs Program, Policy Analyst

**Umatilla Tribe**

Julie Longnecker, Representative  
Antone Minthorn

**Wanapum Tribe**

Richard Buck  
Rex Buck  
Lenora Seelatsee

**Umatilla Tribe**

Jeff van Pelt

**Nez Perce Tribe**

Jason Lyons  
Samuel Penney

**Yakama Indian Nation**

Mike Livingston, Wildlife Biologist  
Greg Cleveland  
Lonnie Selam  
Johnson Meninick  
Lee Hoppis, Vegetation Specialist, Yakama Indian Nation  
Greg Kiona, Cultural Program  
Lea Aleck, Cultural Program

**Forest and Rangeland Ecosystem Science Center, Corvallis, CA**

Jayne Belknap, Research Ecologist, USGS-BRD, (stationed at Canyonlands National Park, Moab, UT)

**Washington Department of Transportation**

Mike Kukes, Pasco Supervisor  
Eilert Bjorge, Asst. Reg. Administrator, South-Central Region  
Rick Gifford, Traffic Engineer, South-Central Region  
Leonard Pittman, Regional Administrator, South-Central Region

**Washington Division of Fish and Wildlife**

Don Larson, Unit Biologist  
Dale Peterson

**Washington State Historic Preservation Office**

Rob Whitlam

**Pacific Northwest National Laboratory**

Charlie Brandt  
Rhett K. Zufelt, Ecology Group, Science and Engineering Associate I  
Dee Lloyd  
Darby Stapp  
Larry Cadwell, Staff Scientist, Pacific Northwest National Laboratory  
Janelle Downs, Plant Ecologist, Pacific Northwest National Laboratory  
Michael R. Sackschewsky, Research Scientist, Pacific Northwest National Laboratory  
David Geist, Fisheries Biologist

**Washington State University**

Steven O. Link, Botany Department.  
Ed Rykeil, Ecologist, Biology Department  
Courtney Conway

**Robert Ranch**  
Robyn Robert

**Bureau of Land Management**  
Gary Yeager

**24 Command Fire**

~~Don Good, Incident Commander~~  
Marsh Haskins, Operations Section Chief  
Don Maks, Operations Section Chief  
Joe Linn, Planning Section Chief

**Audubon Society**  
Bill LaFramboise

**Private**  
Dennis Streng, Entomologist

**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**PART I REVIEW AND APPROVAL**

**U.S. FISH AND WILDLIFE SERVICE, HANFORD REACH NATIONAL MONUMENT**

**I. SUPPRESSION RELATED REHABILITATION APPROVAL**

**Approved**

**Approved with Revision**

Explanation for Revision or Disapproval:

**Disapproved**

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Project Leader, Arid Lands National Wildlife Refuge Complex

Date

**II. EMERGENCY FIRE REHABILITATION APPROVAL**

**Approved**

**Approved with Revision**

**Disapproved**

Explanation for Revision or Disapproval:

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Regional Director, Region 1

Date

**Approved**

**Approved with Revision**

**Disapproved**

Explanation for Revision or Disapproval:

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Chief, Division of Refuges, Washington Office

Date

**U.S. DEPARTMENT OF ENERGY  
BURNED AREA EMERGENCY REHABILITATION**

**PART I                      U.S. DEPARTMENT OF ENERGY, HANFORD NATIONAL LABORATORY**

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**I.    SUPPRESSION RELATED REHABILITATION APPROVAL**

**Approved**

**Approved with Revision**

**Disapproved**

Explanation for Revision or Disapproval:

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Site Manager, Hanford National Laboratory

Date





**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**APPENDIX I. BAER TEAM RESOURCE ASSESSMENTS**

- ! Cultural Resource Assessment**

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- ! Threatened and Endangered Plant Resources Assessment**
- ! Vegetation Resource Assessment**
- ! Wildlife Resource Assessment**
- ! Soil and Watershed Assessment**
- ! Operations Assessment**



**U. S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**24 Command Fire**

**CULTURAL RESOURCE ASSESSMENT**

**I. OBJECTIVES**

- ! Identify and protect previously recorded or documented prehistoric and historic cultural resources within the fire perimeter area.**
- ! Assess damage to known and documented archaeological sites, historic structures, and cultural landscape features from the effects of wildfire and suppression activities.**
- ! Inventory areas disturbed by fire suppression activities and recommend treatments for those cultural properties adversely affected by suppression and rehabilitation actions.**

**II ISSUES**

- ! Assessment of fire and fire suppression effects on previously documented cultural resources as well as those associated with rehabilitation of the 24 Command Fire.**
- ! Protection of cultural resources from suppression-related effects**
- ! Inventory of cultural properties potentially affected by the wildfire and fire suppression activities;**
- ! Protection of prehistoric and historic archaeological resources, cultural significant locations, historic structures, and historic landscapes within the fire suppression and burned areas;**
- ! Evaluation, monitoring, or preservation treatments for cultural resources affected by fire, suppression, or rehabilitation activities.**

**III OBSERVATIONS**

**I. Background Information**

The following information is derived from several widely available sources and is intended to be a cursory overview of present knowledge to provide a context within which the fire, suppression activity, post-suppression inventory, and recommended cultural resource prescriptions may be considered. Supporting documents are cited in the Reference, Part VI.

The 24 Command Fire occurred within an area known as the Pasco Basin Columbia Plateau. Much of the Columbia Plateau consists of a thick sequence of basalt that was formed during Miocene time by successive lava flows. Pleistocene cataclysmic floods, associated with the sudden release of water from ice-dammed Lake Missoula, are responsible for the morphology of the area. Over 40 such events occurred, scouring the basalt bedrock to lay down a relatively coarse-grained flood deposit over low-lying areas of the central Columbia Plateau. The final flood occurred at approximately 13,000 B.P. Within the burn area

these sediments were windblown to create dunes and loess. Flooding has since been confined to the Hanford Reach of the Columbia River.

The Hanford Site and the Arid Lands Ecology Reserve (ALE) contain extensive archaeological deposits left by more than 10,000 years of human activity. The remains of pithouses, graves, spirit quest monuments, hunting camps, game drives, quarries, and hunting and kill sites are represented, as are the structural and archaeological remains of historic farming, ranching, and mineral exploitation. Over 190 cultural resource sites and isolated finds have been recorded within the 24 Command burn area. Two are listed on the National Register of Historic Places (NRHP). The Yakama, Umatilla, Nez Perce Tribes and the Wanapum People maintain cultural ties to the area.

The Columbia Plateau region has been formed by basalt flows, catastrophic flooding, and environmental flux. Prehistoric cultural subsistence systems have been shaped by these changing conditions. The early Holocene (ca. 10,000 years B.P.) was cooler and moister than present conditions. People at this time were probably quite mobile, concentrating on hunting activities. The environment became drier about 8,000 years B. P.; a pattern of seasonal subsistence collection of a wide variety of resources developed with a riverine base. With the return to a more moist and cool environment at approximately 4,500 years B. P. the regional culture began constructing house pits and had a hunter-gatherer subsistence pattern. There is a brief period (3,800 to 3,400 years B.P.) in the archaeological record for which no house pits have been found. When house pits reappear the hunter-gatherer lifestyle continues but with evidence for intensified food processing and food storage, thus setting the pattern for the Columbia Basin that remained into modern times.

Two archaeological districts, each containing numerous and mostly unrecorded prehistoric archaeological sites, have been identified on the ALE Reserve. Both of these districts are listed in the NRHP. Rattlesnake Springs Archaeological District includes sites 45BN170 and 45BN171. Snively Canyon Archaeological District includes sites 45BN172 and 45BN173.

Euro-Americans first came into the Hanford region with the Lewis and Clark expedition. They were followed by fur trappers, military units, and miners passing through on the major rivers. The lack of timber and fur-bearing animals, the apparently agriculturally unpromising soils, the presence of numerous, well established Indians, and the scorching summers were among the salient reasons that the area was not immediately settled by non-Indians.

Like the Indians along the Columbia and Yakima rivers, when the Euro-Americans did settle, they placed ranches and farms adjacent to these important irrigation sources and transportation corridors. By 1880 cattle ranches were established and the railroad soon arrived. The towns of Hanford, White Bluffs, and Richland thrived along the riverbanks in the early 20th century. Oil exploration was conducted in the Rattlesnake Mountain and Rattlesnake Hills area in the 1920's and 1930's, but useful deposits were not found. Natural gas was discovered on Rattlesnake Mountain in the 1920's but the deposits proved too small to be a major continuing economic force. The remains of numerous exploration sites and gas wells are scattered along the foot of Rattlesnake Mountain. The federal government acquired the land for the Hanford Engineer Works in 1943 and proceeded to evacuate all civilians (Indians and whites) from the area. Subsequent removal of much of the standing structures created a large historic archaeological district at the Hanford Site.

Two historic resources identified on the ALE have been determined eligible for listing in the NRHP; White Bluffs Road (H3-121) and the Nike Missile Anti-aircraft artillery (H-52-C and H-52-L). A segment of the White Bluffs Road runs through the northern portion of the ALE. This road was an important transportation and supply route between Yakima and a ferry landing site on the Columbia River at White Bluffs. The route was used by settlers and traders as early as the 1860's, and may have been built on an existing trail used by the Native Americans.

Between 1955 and 1961 NIKE Ajax and Hercules missiles were deployed by the U.S. Army at four locations on the Hanford Site, three on the North Slope and one on the ALE. Of the four NIKE locations only the launch and radar control site (H-52-C and H-52-L) on the ALE remain intact. That site has been recommended as eligible for the NRHP as a significant complex due to their important association with the defense of the Hanford Site.

The United States Government acquired the land for a secure location to begin the large-scale production of plutonium, the material used in the world's first and third atomic bomb explosions. The efforts in research and development expended during the Manhattan Project at Hanford continued to influence developments during the Cold War period in plutonium production for national defense and non-defense nuclear applications, including energy production and human health and environmental restoration fields.

The Hanford Site and ALE is an important region to members of the Yakama, Umatilla, and Nez Perce Tribes, as well as the Wanapum People. Their ancestors resided on the land, utilized its resources and in so doing created a culture closely woven with the landscape. Several properties on the ALE have been identified as culturally significant by the tribes.

**Table CR.1 24 Command Fire Cultural Resource Advisors**

Name	Home Office	Work Period
Michael Boynton	USFS Columbia River Gorge NSA	6/30 to 7/7
Nicholas Valentine	USFWS Region 1 Cultural Resources Team	7/1 to 7/7
Bob Hazelbrock	Pacific Northwest National Laboratory	7/3 to 7/5

#### **B. Reconnaissance Methodology**

Protection of human life and property from wildfire takes precedence over the protection of historic and prehistoric cultural properties. However, the diminishing numbers of archaeological sites, traditional cultural sites and resources of cultural importance representing millennia of human life must be provided protection whenever possible.

The protection of cultural resources did not appear to be a priority during initial suppression of the 24 Command Fire. The explosive spread of the fire and the very limited cultural heritage personnel available prevented any effective intervention during suppression. Cultural resource assessment and protection efforts did not begin until the arrival of the BAER Team in Richland, Washington on June 30, 2000.

U.S. Forest Service Archaeologist Michael Boynton, Columbia River Gorge Natural Scenic Area, Oregon was dispatched as a member of the 13 person BAER Team. Fire perimeter orientation, and overview flights occurred on July 1, 2000. Nicholas Valentine, Archaeologist from U.S. Fish and Wildlife Service Region 1 and Bob Hazelbrock, Archaeologist Pacific Northwest National Laboratory, Richland, Washington assisted in subsequent cultural resources records check and field review.

BAER policy recognizes cultural resources as a critical resource requiring assessment and protection. A guiding principle as well as a legal requirement of burned area rehabilitation is to regard archaeological sites and other materially fragile cultural resources when proposing emergency rehabilitation treatments. If post-fire conditions indicate erosion threats or other actual

or potential watershed problems, cultural resources must receive special attention to ensure that their unique and irreplaceable values are given full consideration.

Incident-related damages to cultural resources fall in two broad categories: fire-related and suppression-related. Fire-related impacts include thermal fracture of obsidian, basalt, chert, granite and other stone artifacts, destabilization or destruction of structures and features. Other impacts include destruction of organic elements in an occupational or midden deposit, destabilization of soils within a site or landscape with resultant increased erosion and deflation of loosened sediments, and increased susceptibility to looting and surface collection due to greater visibility.

Suppression related impacts occur with disturbance or destruction from dozer or hand line construction, use of sites for fire camp or equipment staging. Rehabilitation activities also may cause impacts, including restoration of dozer and hand lines, silt basin construction, restoration of range and forest land, and replacement of infrastructure.

### C. Findings

The 24 Command Fire cultural resource assessment addresses possible effects to a minimum of 190 previously recorded historic and prehistoric archaeological sites. These sites range from lithic scatters to can scatters, Indian hunting sites to ranch buildings, spirit quest monuments to gas production wells. As many of these sites can occur within the same physical space rehabilitation can be quite complex. The preliminary assessment of fire effects on known cultural resources was significantly hindered by the lack of ready access to the cultural resource

At the heart of this problem is the fact that the major portion of the 24 Command Fire occurred on the Arid Lands Ecology reserve (ALE). Management of the ALE was recently acquired by FWS. Although copies of site forms, survey maps and other cultural resource records have been requested of the previous ALE land managers, those records have not been transferred to FWS. Hence, retrieval by BAER personnel of specific site location and description data in a timely manner was impossible. Access to the database was provided on July 3 by a PNNL archaeologist, however this was not in time to assist in the field review phase of the cultural resource assessment. Complete site assessments must await the cultural resource inventory of the previously documented sites within the burned area, and the compliance surveys performed in advance of the variety of rehabilitation actions recommended in the BAER Plan.

A preliminary inventory of pre-historic and historic sites on the ALE was conducted by archaeologists assigned to the BAER team on July 1 and July 2, 2000. Of the 19 sites marked on maps in the Smithsonian trinomial system 8 were visited. Two other locations were noted in transit and inspected. Subsequent review of site maps indicated that one of these locations had been recorded as several sites but none were issued trinomial site numbers. One site appears to have been an unrecorded spirit quest monument. The second location has components from several periods of occupation, including many fragments of depression era glass. The glass had not been melted, spalled, shattered, or otherwise severely altered by the fire. This observation was also noted for lithic debris at prehistoric sites. However, wood structures, such as a corral, were apparently destroyed by the fire.

Overall, the area burned at a low severity. The fire was wind-driven through cheatgrass and sage, and did not dwell long enough to completely consume all vegetation or to create hydrophobic soils. Fine plant roots were usually observed immediately below the surface, indicating that the organic composition of the soil and consequently of archaeological sites has not been affected to a significant extent.

#### **IV. RECOMMENDATIONS**

Three specifications were prepared to address known and potential effects to cultural resources. These specifications may be accomplished by force account, contract or inter-agency agreement. The specifications address potential affects and specific rehabilitation needs for properties damaged by the fires, inventory and assessment of previously recorded cultural resources, and law enforcement monitoring of sites exposed by the removal of vegetation. The inventory of previously uninventoried areas in advance of ground disturbing activity for other rehabilitation projects will be accomplished under the compliance process for those undertakings. At this writing no subsurface deposits appear to have been damaged or are threatened by post fire erosion. Therefore no archaeological site data recovery is recommended at this time.

##### **A. Management (specification related)**

###### **C-1b Cultural Resources Damage Assessment - Suppression**

A field inventory of locations disturbed by the fire suppression effort, or areas with the potential to be effected by rehabilitation activities will be undertaken to identify potential effects to cultural resources. Evaluation of those effects and development of necessary mitigation or treatment plans will be undertaken as required.

###### **C-1a Cultural Resources Damage Assessment - Fire**

A complete cultural resource field inventory and evaluation of previously recorded and documented sites within the area burned by the 24 Command Fire will be accomplished. The product will be a condition assessment for cultural resource compliance and rehabilitation purposes. Site stabilization measures will be developed and implemented as warranted.

##### **B. Monitoring (specification related)**

###### **S-1 Public Safety: Protect Cultural Resources**

The ALE and the burn area is officially closed to the public. The visibility of sensitive historic and prehistoric cultural materials has been increased in the wake of the 24 Command Fire. Due to the propensity for looters to operate within areas exposed by fire, selected historic and prehistoric archaeological sites and localities will be patrolled to monitor and deter site looting and vandalism.

##### **C. Management (non-specification related)**

Post suppression rehabilitation of vegetation through planting of seeds or container plants has the potential to effect historic and prehistoric cultural properties. As specific revegetation plans are developed they must be reviewed by agency archaeologists, Tribes, and consultation with the State Historic Preservation Officer must be documented.

Specifications for rehabilitation undertakings must include Section 106 compliance, and include specific provisions for the protection of identified cultural resources. The contractor must be informed of areas to be avoided by flagging or UTM locations, and of the requirement to follow specific site treatment requirements. Inspectors must be responsible for monitoring and documenting compliance. Archaeological monitors may be required at specific locations. Monitors should



have direct contact with the Contracting Officers Representative to ensure compliance with the cultural resource protection requirements.

The FWS and DOE should pursue a mutually agreeable method for the sharing of cultural resource information and ready access to records for sites formerly under DOE jurisdiction and now under FWS management. The development of a shared GIS cultural resources layer should be a priority undertaking in order to provide site information to archaeologists and land managers in a timely manner for future emergency events.

Given the significant cultural resources of the area, a temporary cultural resource position should be established to monitor the implementation of the specifications for cultural resources and rehabilitation specifications developed by other disciplines within the Hanford Reach National Monument and the Arid Lands National Wildlife Refuge Complex.

Post fire surface visibility has greatly enhanced the ability to identify surface expressions of archaeological sites. There is an opportunity to refine the boundaries of known sites, define archaeological districts and to locate new sites. In addition, as fire in the area was a natural occurrence throughout human occupation of the area there is an opportunity to study this fire's effects on known culturally significant resources and in the archaeological record.

The locations and expressions of archeological sites can not be determined with certainty. If in the course of any rehabilitation or restoration activity cultural resources are discovered all work in the vicinity must stop and the appropriate agency archaeologist consulted.

## V. CONSULTATIONS

Table CR.3 Consultations Concerning the 24 Command Fire.

Date	Contact	Type	Action	Response
1 July	Johnson Meninick, Yakama Tribe	Fax	notice of BAER work	none
1 July	Lenora Seelatsee, Wanapum Tribe	Fax	notice of BAER work	none
1 July	Antone Minthorn, Umatilla Tribe	Fax	notice of BAER work	none
1 July	Samuel Penney, Nez Perce Tribe	Fax	notice of BAER work	none
4 July	Johnson Meninick, Yakama Tribe	Fax	CR treatment plans	none
4 July	Lenora Seelatsee, Wanapum Tribe	Fax	CR treatment plans	none
4 July	Antone Minthorn, Umatilla Tribe	Fax	CR treatment plans	none
4 July	Samuel Penney, Nez Perce Tribe	Fax	CR treatment plans	none
5 July	Rob Whitlam, Washing SHPO	Fax	CR treatment plans	comments provided
5 July	Dee Lloyd, PNNL	Fax	CR treatment plans	meeting on 6 <sup>th</sup>
5 July	Darby Stapp, PNNL	Fax	CR treatment plans	meeting on 6 <sup>th</sup>

5 July	Kevin Clark, DOE	Fax	BAER Handbook Ch.1., July 5 <sup>th</sup> correspondence	none
5 July	Johnson Meninick, Yakama Tribe	Phone	CR treatment plans	Not available. Contacted Sandra Kiona
5 July	Richard Buck, Wanapum Tribe	Phone	CR treatment plans	comments provided
5 July	Rex Buck, Jr., Wanapum Tribe	Phone	CR treatment plans	left message
5 July	Jeff van Pelt, Umatilla Tribe	Phone	CR treatment plans	left message
5 July	Jason Lyons, Nez Perce Tribe	Phone	CR treatment plans	No longer employed by tribe. Left message for Vera Phonic
5 July	Rob Whitlam, Washington SHPO	Phone	CR treatment plans	comments provided
5 July	Dee Lloyd, PNNL	Phone	CR treatment plans	comments provided
5 July	Darby Stapp, PNNL	Phone	CR treatment plans	comments provided
5 July	Greg Cleveland, Yakama Tribe	Fax	CR treatment plans	comments provided
6 July	Rex Buck, Wanapum Tribe	Fax	Invitation to closeout	
6 July	Samuel Penney, Nez Perce Tribe	Fax	Invitation to closeout	
6 July	Antone Minthorn, Umatilla Tribe	Fax	Invitation to closeout	
6 July	Lonnie Selam, Yakama Tribe	Fax	Invitation to closeout	
6 July	Kevin Clark, DOE	Fax	Above July 5 <sup>th</sup> correspondence	

## VI. REFERENCES

2000, *Establishment of the Hanford Reach National Monument*. Presidential Proclamation 7319.

1998, *Handbook of North American Indians*, Volume 12: Plateau. Walker, Jr. Deward (Editor) Smithsonian institution, Washington.

1996, Draft *National Register of Historic Places Multiple Property Documentation Form. Historic, Archaeological and Traditional Cultural Properties of the Hanford Site, Washington* Prepared for U.S. Department of Energy, Richland Operations Office by Battelle Pacific Northwest National Laboratory

N.D., *EE.II Hanford Area Land Use A Historical Perspective*. M.S. Gerber, Ph.D

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**U. S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**24 Command Fire**

**THREATENED AND ENDANGERED PLANT RESOURCES ASSESSMENT**

**1. OBJECTIVES**

- !** Identify and locate threatened and endangered plant species impacted by fire and/or suppression actions.

**II. ISSUES**

- !** Determine impacts of fire to one federally listed and eight state listed threatened, endangered and sensitive plant species and/or habitat.

**III. OBSERVATIONS**

Emergency consultation was held with the U.S. Fish and Wildlife Service (USFWS) on July 3, 2000 for threatened and endangered (T&E) species known to occur within the 24 Command Fire area in Richland, Washington. A current USFWS species list and a State of Washington species list was obtained on July 3, 2000 by the Deputy Project Manager of the USFWS Arid Lands Ecology (ALE) Refuge Complex. One federally listed plant species was identified and eight previously inventoried state listed species were known to occur within the fire area. Contacts were made with local experts to determine if additional sensitive species of concern were potentially affected by the fire and suppression actions.

Washington State listed species known to occur within the fire area will be discussed within this assessment due to management guidelines and policies administered by the USFWS and Department of Energy (DOE) for the impacted lands. All planning documents covering the ALE focus on the preservation and protection of the shrubland-steppe as a primary management goal. Current management direction provides for the protection, monitoring and recovery of federally listed and state listed threatened, endangered, and sensitive species. T&E plants will be discussed separately in order to better document current information regarding habitat and fire effects to each species.

A complete list of Washington State T&E plant species that occur within the Hanford Project Area is included within Appendix V. Species on this list that are not discussed below have been eliminated from analysis in this assessment as they are not known to exist or have not been mapped within the fire area.

**A. Background**

Refer to Vegetation Assessment.

**B. Reconnaissance Methodology and Results**

On July 3, 2000 emergency consultation was initiated with the USFWS- ALE to verify documented T&E species (flora and fauna) within the fire area. A current species list was obtained and provided to the BAER Team vegetation and wildlife specialists. At that time it was confirmed that the list contained one federally listed T&E plant species and eight known state listed species within the fire area that occur in Benton County, Washington.

On July 3, 2000 the BAER Team Vegetation Specialists met with natural resource staff from the USFWS, Arid Lands National Wildlife Refuge Complex Office and the DOE, Pacific Northwest National Laboratory Office to obtain baseline habitat and location information pertaining to known T&E plant species.

The species identified within the fire area include:

Ute ladies'-tress	<i>Spiranthes diluvialis</i>	Federally listed- Threatened
Bristly cryptantha	<i>Cryptantha spiculifera</i>	State listed- Sensitive
Piper's daisy	<i>Erigeron piperianus</i>	State listed- Sensitive
Coyote tobacco	<i>Nicotiana attenuata</i>	State listed-Sensitive
Dr. Bill's locoweed	<i>Astragalus conjunctus var novum</i>	State listed-Review Group 1
Columbia milkvetch	<i>Astragalus columbianus</i>	State listed-Threatened
Desert evening-primrose	<i>Oenothera caespitosa</i>	State listed-Sensitive
Camissonia	<i>Camissonia pygmaea</i>	State listed-Threatened
Gray Cryptantha	<i>Cryptantha leucophaea</i>	State listed- Sensitive

A comparison was made between the known locations of the above listed species and the vegetation mortality map (Appendix III) in order to determine direct fire effects. A review was also conducted using the Fire Effects Information System (FEIS) at the National Interagency Fire Center to determine known effects on these species. A review of the FEIS system was conducted on July 5, 2000 and showed that no current information is recorded within this data base pertaining to known fire effects.

Additionally, on July 5, 2000 the Vegetation Specialist held discussions with staff of the ecology group of the Pacific Northwest National Laboratory to discuss known effects to any of these species. Fires have periodically burned within the Hanford area and on ALE. Some research is currently underway on the ALE where a portion of Yakima Ridge burned in 1998 however the data have yet to be compiled and evaluated. To date, no known comprehensive studies have been conducted to document fire effects on the currently listed T&E species within these shrub-steppe plant communities.

Outlined below is a brief synopsis of the associated habitat(s) for the listed species and potential fire impacts to each:

Ute ladies'-tress:

- Habitat:** Ute's ladie's-tresses is a perennial terrestrial orchid which generally requires a symbiotic association with mycorrhizal fungi for seed germination. This is a lowland species that typically occurs beside or near moderate gradient, medium to large streams or rivers in the transition zone between the mountains and plains. Soil moisture for this species must be at or near the surface throughout the growing season.
- Findings:** Based upon the above habitat requirements and a search of available T&E field inventory data, suitable habitat for Ute ladies'-tress does not occur and this plant has not been found to exist within the fire area. Therefore a NO EFFECT determination has been made for this species.



### Bristly cryptantha

- Habitat:** Bristly cryptantha ranges from central Washington and eastern Oregon to northeastern California and northern Nevada, east throughout the Snake River Plains of Idaho and western Montana where it generally grows in dry, open sites often in stony and shale soils. Four known populations are located in the Hanford site and are associated with big sagebrush, Sandberg's bluegrass and winterfat plant communities.
- Findings:** Direct fire effects to the known habitat of this species was minimal. Located within a mosaic burn area of the fire, fire intensities were low and the mapped location of this species may have been within unburned islands of fuel. Potentially there could be the loss of above ground vegetative portions of this species, however the growth cycle for this plant had concluded for this growing season and it is anticipated that no long-term detrimental effects will occur. Other direct fire effects to this species are unknown at this time. Monitoring of post fire populations will be needed in order to determine any detrimental impacts to the species.

### Piper's daisy:

- Habitat:** Piper's daisy occurs in the winterfat/Sandberg's bluegrass plant community type and in big sagebrush/bluebunch wheatgrass communities. This species often occupies south-facing slopes of undisturbed areas of the sagebrush steppe. Populations of this species on the Rattlesnake Mountain area were observed to be thriving during the BAER team's assessment work on the fire.
- Findings:** Direct fire effects to the known habitat of this species was varied. Some populations were located within the mosaic burn areas of the fire. In these areas, fire intensities were low with many plants still blooming and thriving. In other populations within the fire area, 75-100% of all vegetative species were burned as a result of high fire intensities. Above ground portions of shrub, grass, and forb species had been removed by the fire which will change the characteristics of the plant association, (species diversity, percent bare ground, soil temperatures, etc.) for many years. Long-term fire effects to this species and the relationship it has with associated vegetation types are unknown at this time. Monitoring of post-fire populations will be needed in order to determine any detrimental impacts to the species.

### Coyote tobacco:

- Habitat:** Coyote tobacco is currently known to exist within the big sagebrush/Sandberg's bluegrass plant association. This species was recently found to exist within the fire area however an inventory conducted in the spring of 2000 did not re-locate plants observed the prior year.
- Findings:** It currently is unclear as to the exact location of this species within the fire area. The last reported siting of this plant is within a mosaic burn area where fire intensities were low and some unburned islands of vegetation remain. Adjacent stands of big sagebrush were adversely impacted however, whereby 75-100% of shrub, grass, and forb species had been removed by the fire which will change the plant association characteristics, (species diversity, percent bare ground, soil temperatures, etc.) for many years. Additional field inventories are needed to pinpoint the exact location of this species within the burn area and post-fire monitoring will be required in order to determine fire effects to this species.

### Dr. Bill's locoweed:

- Habitat:** Dr. Bill's locoweed is scattered in bunchgrass areas along the main ridges of Rattlesnake Mountain. The population includes several tens of thousands of plants however the population is presently incompletely mapped. This species is known to exist entirely within the boundaries of the ALE Reserve.
- Findings:** Direct fire effects to the known habitat of this species was varied. Some populations were located within the mosaic burn areas of the fire where fire intensities were low with many plants still blooming and thriving. The north slope of Rattlesnake Mountain contains many small islands of unburned vegetation and the south slope plant communities were observed to be unburned. Plant communities below the 2,000 foot elevational line were more severely impacted as 75-100% of all vegetative species were burned as a result of high fire intensities. Above ground portions of shrub, grass, and forb species were removed by the fire which will change the plant association characteristics, (species diversity, percent bare ground, soil temperatures, etc.) for many years. Long-term fire effects to this species and the relationship it has with associated vegetation types are unknown at this time. Monitoring of post-fire populations will be needed in order to determine any detrimental impacts to the species and population size.

**Columbia milkvetch:**

- Habitat:** Columbia milkvetch is a local endemic and is found in Yakima, Kittitas, and Benton Counties in south-central Washington. It was once thought to be extinct but has since been found to be relatively common within its limited range. Most of the Hanford populations grow in the big sagebrush/ bluebunch wheatgrass and big sagebrush/ Sandberg's bluegrass plant associations mostly in well-drained sandy and gravelly loams, lithosols, and cobbly sand most frequently found in early seral stage plant communities following disturbance.
- Findings:** Primary populations of Columbia milkvetch have been mapped in the Yakima Ridge area. Recovery from a 1998 wildland fire that impacted this area has been slow resulting in limited fine fuel accumulations within the inter-spaces of these plant communities. During the 24 Command incident, fire intensity was low and vegetative losses were minimal as the fire burned in a mosaic fashion. Satellite imagery will be available in approximately 2 weeks from the approval date of this plan and can be utilized to do more intensive vegetative mapping of fire effects to the habitat of this species. Long-term fire effects and the relationship this species has with its associated vegetation types are unknown at this time. Monitoring of post-fire populations will be needed in order to determine any detrimental impacts to the species.

**Desert evening-primrose:**

- Habitat:** Evening-primrose is a perennial that favors dry, open habitats, occurring as individuals or colonies on clay soils, rocky slopes composed of shales, volcanic, sandstones, bluffs, and exposed rocky ridges.
- Findings:** This species is known to occur in the Yakima Ridge area of the fire on steep talus slopes. During the 24 Command incident, fire intensity was low and vegetative losses were minimal as the fire burned in a mosaic fashion. Talus slopes on Yakima Ridge appeared unburned due to the loss of fine fuels within these areas during the 1998 fire. Monitoring of post-fire populations will be needed in order to determine any detrimental impacts to the species.

**Camissonia:**



- Habitat:** Camissonia is a perennial forb that favors dry, open habitats, occurring on stony soils, basalt blocks, cobbles with silt, sand and caliche fragments. The surrounding plant community is bitterbrush/Sandberg's bluegrass.
- Findings:** This species is known to occur in the Yakima Ridge area of the fire on south-facing slopes. During the 24 Command incident, fire intensity was low and vegetative losses were minimal as the fire burned in a mosaic fashion. Southerly slopes on Yakima Ridge burned at a very low intensity due to low litter layers which were removed during the 1998 fire. Monitoring of post-fire populations will be needed in order to determine any detrimental impacts to the species.

#### Gray cryptantha

- Habitat:** Gray cryptantha grows on swales and slopes of somewhat to moderately well vegetated sand dunes and other sandy habitats. It is usually associated with the bitterbrush/Indian rice-grass dune coples plant association.
- Findings:** Gray cyptantha has been mapped near the central landfill on DOE however populations are believed to exist across the entire dune area. Monitoring of previously mapped, post-fire populations will be needed in order to determine any detrimental impacts to the species.

### 3. Indirect Effects

Indirect effects are those that may occur or are anticipated to occur which may either be beneficial or detrimental to the species. As discussed above, long-term monitoring of T&E species will be required in order to better quantify the effects of the 24 Command Fire on each species and its related habitat.

Indirect detrimental effects to these species could result from competition from invasive plant species, potential loss of soil productivity due to wind erosion, loss of seed viability when exposed to the elements.

However, it is important to note that beneficial effects may assist some species in their recovery or provide opportunities for species enrichment. In those areas where fire intensity was low and the fire burned in a mosaic fashion, some benefits to T&E species may be derived. These benefits may result from: the release of nutrients back into the soil profile; a reduction in competition for soil nutrients, sun, and soil moisture from other perennial species for the first 1-2 years during the recovery period; and the re-establishment of plants from roots and soil seedbanks. It was noted that all of the state listed T&E species are forbs which had completed their life cycle for this growing season. Although the fire burned at varying intensities across the landscape, in most cases the residency time of the fire was short enough so as not to damage the soil, existing root systems, or reduce native seed banks in the known habitats of these plants.

Close monitoring of the known sites of T&E species with careful documentation of effects will be important to gain a better understanding of the fire effects to these species within the affected plant associations. Monitoring work is also needed to comply with Agency mandates for the protection and prevention of unacceptable degradation of T&E species. It is imperative that USFWS and DOE staff input collected data into the existing FEIS system to ensure that fire effects data is available in the future for these species.

## IV. RECOMMENDATIONS

### A. Management (specification related)-None

**B. Monitoring (specification related)**

1. **M-1a- Monitor T&E Plant Species Recovery:** Conduct short-term monitoring (2 years) on known locations of *Astragalus columbianus*, *Cryptantha interrupta*, *Erigeron piperianus*, *Nicotiana attenuata*, and *Astragalus conjunctus var novum* within the fire area to determine fire effects on these species. Surveys should be conducted by both jurisdictions in a cooperative manner to determine fire effects on these species and their post-fire recovery potentials.

**V. CONSULTATIONS**

Larry Cadwell, Staff Scientist, Pacific Northwest National Laboratory  
Janelle Downs, Plant Ecologist, Pacific Northwest National Laboratory  
Michael R. Sackschewsky, Research Scientist, Pacific Northwest National Laboratory  
Heidi L. Brunkal, Wildlife Biologist, US Fish and Wildlife Service, Arid Lands Refuge Complex  
Greg Hughes, Project Leader, US Fish and Wildlife Service, Arid Lands Refuge Complex

**VI. LITERATURE REVIEWED:**

July 3, 2000. USFWS T&E Species List for Benton, Adams, Franklin Counties, Washington State.

USDI-DOI. *Effects of Fire on Threatened and Endangered Plants: An Annotated Bibliography.*

Final Report. 1994-1999. *Biodiversity Inventory and Analysis of the Hanford Site.* The Nature Conservancy of Washington.

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Proclamation 7319 of June 9, 2000. *Establishment of the Hanford Reach National Monument.*

*Permit and MOU for the Management of the Arid Lands Ecology Refuge.* June 25, 1997.

1997. *National Wildlife Refuge System Improvement Act of 1997.*

USFWS. *Fire Management Handbook.* Emergency Fire Rehabilitation Standards.

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**U. S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**24 Command Fire**

**VEGETATION RESOURCE ASSESSMENT**

**I. OBJECTIVES**

- !** Evaluate and assess fire and suppression impacts to vegetative resources and identify values at risk associated with vegetative losses.
- !** Determine rehabilitation and monitoring needs supported by specifications to aid in vegetative recovery and soil stabilization.
- !** Evaluate potentials for invasive species encroachment into native plant communities within the fire area.
- !** Provide management recommendations to assist in vegetative recovery, watershed stabilization, site productivity and species habitat protection and rehabilitation.

**II ISSUES**

- !** Suppression effects and short/long-term impacts to plant communities and vegetative resources within the 24 Command Fire on federal, county, private, and state lands.
- !** Protection and enhancement of other resource values including site productivity, wildlife habitat, vegetative resources, cultural resources and watershed stability.
- !** Management strategies which provide for the stabilization, natural regeneration and recovery of impacted areas.
- !** Monitoring of the planting/seeding effectiveness of rehabilitation efforts.
- !** Monitoring of impacted lands for the early detection and control of invasive and noxious weed species.

**III. OBSERVATIONS**

This report identifies and addresses known and potential impacts to vegetative resources within the 24 Command Fire in Richland, Washington.

The burned area consists of approximately 164,000 acres of riparian and Columbia Basin shrub-steppe plant communities. Vegetative resources provide forage and cover for a variety of wildlife species, aesthetic values, watershed stability, and biologically diverse plant associations. The impacted plant communities serve as the largest remaining example of the contiguous expanse of native sagebrush/bunchgrass communities in the State of Washington and globally.

Findings and recommendations contained within this assessment are based upon information obtained from personal interviews with land managers, resource specialists, researchers, BAER Team specialists, literature research, and field reviews of the fire area.

Reconnaissance of impacted areas included aerial and ground survey methods. This assessment will attempt to capture the concerns expressed by staff from the US Fish and Wildlife (USFWS), Department of Energy, and the general public. Many entities have been impacted by this fire and all have demonstrated a cooperative spirit and concern for the future management of these lands. This report will detail the known damage to vegetative resources; will discuss revegetation processes and future monitoring criteria; and will outline management considerations for recovery of the vegetative resources.

## **A. Background**

The 24 Command Fire began on June 27, 2000 near the Yakima barricade on the Department of Energy's (DOE) Hanford Site as a result of an automobile accident. Fueled by erratic winds, extreme day-time temperatures and dry fuel conditions, the fire spread quickly throughout the Arid Lands Ecologic Refuge (ALE) and the Central Hanford Area.

Vegetative resources were extensively impacted by this fire on federal, county, private and tribal lands. As detailed later in this report, fire impacts ranged from total loss of understory species, varying degrees of loss in shrub plant communities, to the total removal of all plant communities.

Concerns expressed by federal, state, county and private sources concerning vegetative resources include: vegetative loss and the short and long term impacts to wildlife habitat, microbiotic crusts, ecological integrity of the shrub-steppe plant associations, noxious weed and invasive species encroachment, archaeological resources, watershed stability, site productivity, aesthetics, public safety, impacts to threatened or endangered plant and animal species, and potential long-term affects to the shrub-steppe ecosystems.

Plant associations within the fire include sagebrush/bunchgrass, sagebrush/cheatgrass, Bitterbrush/bunchgrass, winterfat/bunchgrass, Black greasewood/alkali saltgrass, and abandoned agricultural fields dominated by forbs and annual grass communities. Topography, aspect, and elevation dictate the variability of the vegetative communities within the fire area as well as the soil textures and depths.

At more than 360,000 acres, the Hanford Site is one of the largest contiguous pieces of shrub-steppe habitat remaining in the Columbia Basin. The uniqueness and biological diversity of the area was formally recognized by Presidential Proclamation 7319 on June 9, 2000 establishing this area as the Hanford Reach National Monument. The monument as been described as a "biological treasure" that embraces important riparian, aquatic and upland shrub-steppe habitats that are rare or in decline in other areas. Within the area is a mosaic of habitats that support a wealth of increasingly uncommon native plant and animal species which is unmatched in the Columbia Basin. Because of the high diversity of native plant and animal species, the large number of rare and sensitive plant species, the well developed microbiotic crusts and significant breeding populations of nearly all steppe and shrub-steppe dependent species, the USFWS has been tasked to preserve and protect these objects of antiquity in perpetuity.

The Hanford Reach land base, originally established in 1943 by the US Government as a national security area for the production of weapons-grade plutonium has restricted public access and has been free of agricultural influences for over four decades. This area has preserved the habitats of, and now serves as a refuge for, various native plants and animals.

## **B. Reconnaissance Methodology and Results**

On June 30, 2000 , the Interagency BAER Team assembled at the ALE Office in Richland, Washington to begin rehabilitation assessments. On June 30 & July 1, 2000 the Vegetation Specialist met with representatives from USFWS and DOE to obtain issues and objectives for emergency rehabilitation actions, baseline information pertaining to known impacts and information related to vegetation resources. Upon consultation with local staff, and after reviewing the burned areas within the fire perimeter, direct fire impacts have been documented for all plant communities.

Aerial reconnaissance of the burned area was conducted on July 1 and again on July 4, 2000 to map burn intensity and vegetation mortality and to determine and document losses of vegetative resources. The fire burned in a mosaic fashion on approximately 15% of the fire area. Due to extremely dry conditions and high winds, vegetation resources were significantly reduced on approximately 85% of the fire area. That is, standing biomass of shrubs, grasses, and forbs were 90-100% consumed over 85% of the fire area.

Field reconnaissance of the fire was conducted between July 1 - July 4 with the aide of local resource experts. Each plant association type was inspected to determine vegetative losses, requirements for rehabilitation efforts, recovery potentials, and long-term rehabilitation needs. Observations were made of fire impacts to duff layers, live crown tissue on grass and shrub species, and on impacts of the fire to existing seed banks.

A literature review was conducted to obtain baseline data on soils, hydrologic processes, plant communities, invasive species establishment potentials and the importance of vegetative species. The ALE is one of the most researched land units in the Columbia Basin with extensive background studies and reports available. Many well written documents exist that detail historic and present day vegetation descriptions. Excerpts from these documents have been included to provide the reader with a better understanding of plant community structure and provide insight into the fragility of these ecosystems.

### **II Vegetation:**

The 24 Command Fire burned approximately 164,000 acres of federal and private lands in and around the communities of Richland and Benton City, Washington. Due to extreme fire behavior, fuel conditions, topography, and weather varying amounts of vegetative cover was lost.

The diversity and vast size of native plant communities found on the Hanford Site is unmatched in the ecoregion. Biodiversity inventory personnel and the Washington Natural Heritage Program identified a total of 17 terrestrial, native plant community types (or elements) that occurred as 48 separate element occurrences on the ALE Reserve and North Slope. The terrestrial element occurrences covered approximately 90,000 acres, occupying significant amounts of the ALE Reserve. The condition and size of the big sagebrush (*Artemisia tridentata*) / bluebunch wheatgrass (*Pseudoroegneria spicata*) on the ALE Reserve, and the bitterbrush (*Purshia tridentata*) / Indian ricegrass (*Oryzopsis hymenoides*) and big sagebrush / needle-and-thread (*Stipa comata*) dune complex occurrences on the North Slope and Central Hanford are extensive and of particular regional importance.

Primary plant communities impacted by the fire included the following plant associations:

**Big Sagebrush/bluebunch wheatgrass:** This community type is characterized by big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg's bluegrass (*Poa secunda*), diverse forbs, and where relatively undisturbed, a robust microbial crust. This community is widely distributed throughout the region in loamy soil types although it is frequently associated with a understory cover of cheatgrass.

**Big Sagebrush/Sandberg's bluegrass:** This community type is characterized by big sagebrush, Sandberg's bluegrass, spiny hopsage (*Grayia spinosa*) and low forb diversity. The plant community type is generally confined to locations too dry for bluebunch wheatgrass on soil that is finer-textured than is typical for needle-and-thread associations.

**Big Sagebrush/Needle-and thread:** Big sagebrush is the dominant shrub, although bitterbrush (*Purshia tridentata*) commonly occurs at varying levels. Thickspike wheatgrass (*Agropyron dasystachum*) may occur in the understory. Where intermixed with bluebunch wheatgrass, needle-and-thread is thought to increase with disturbance.

**Bitterbrush/ Indian ricegrass dune Complex:** This community type occurs on active dunes and other extremely sandy soils. Primary species include bitterbrush, Indian ricegrass (*Oryzopsis hymenoides*), often with cheatgrass and tumbleweeds.

**Big Sagebrush/Cheatgrass:** This community is primarily composed of Big sagebrush with an understory dominated by cheatgrass (*Bromus tectorum*).

**Black Greasewood/Alkali saltgrass:** This plant community is composed of greasewood (*Sarcobatus vermiculatus*) and alkali saltgrass (*Distichlis stricta*).

**Winterfat/Sandberg's bluegrass:** This plant community is primarily composed of winterfat (*Eurotia lanata*) and Sandberg's bluegrass. Overall species diversity is low, however the rare plant Piper's daisy (*Erigeron piperianus*) frequently occurs.

**Three-tip Sagebrush:** At the higher elevation of the ALE Reserve, three-tip sagebrush (*Artemisia tripartita*) begins to co-occur with or replace big sagebrush as the dominant shrub with bluebunch wheatgrass as the primary understory graminoid species.

**Willow Riparian Complex:** This riparian community is characterized by diverse shrubs and trees that include a substantial component of willow (*Salix*) species. Within the fire area it was observed in the Rattlesnake Springs, Snively Canyon, Benson Springs, and Yakima River areas.

The above list of plant communities is a very simplified accounting of the major plant communities that have been impacted by the 24 Command fire area. Species diversity within each of the major community types has been altered in some areas due to the activities of neo-European people that entered the region beginning 200 years ago. In more recent history, alien plants were introduced and established a foot-hold in the shrub-steppe communities with the advent of livestock grazing in the mid-1800's and through agricultural cultivation and urbanization later in the century.

Vegetation within this area has also been altered through the establishment of cheatgrass within sage communities and the shortening of the natural fire return interval. Historically, fire return intervals were between 50-100 years in the shrub-steppe region. Fires burned in a mosaic fashion across the landscape leaving many healthy remnant stands of bunchgrass and sage. The mosaic fire patterns allowed for the survival of healthy sage communities and habitat for wildlife species. However, as

witnessed in the 24 Command fire, an increase in fine fuels in the understory sagebrush communities created a condition for a large, high intensity event on approximately 85% of the fire area.

Within the Big sagebrush and Three-tip sagebrush communities, cheatgrass provided ladder fuels for fire to quickly spread into and throughout these stands. In areas where native bunchgrass dominated the understory, fire impacts to some shrub stands were greatly reduced.

In order to better quantify impacts to vegetation, four mortality classes were developed and utilized to map the fire area. The four classes developed were:

- Class 1:       Remnant stands intact
- Class 2:       25-50% Vegetative losses
- Class 3:       50-75% Vegetative losses
- Class 4:       75-100% Vegetative losses

Using these four mortality classes, the vegetation specialist took into account the impacts of the fire on grass, forb, shrub, and tree species. In some areas where the fire moved very quickly through a sagebrush stand, understory vegetative losses may have been classed in the 50-75% category whereas actual shrub losses may have been less. The intent of mapping vegetation in these classes was to determine impacts to wildlife habitat, native plant associations and their recovery ability, watershed stability, and potential treatment recommendations. On July 5, 2000 a satellite image of the fire area was shown to the vegetation specialist by DOE Ecosystem Monitoring personnel. This image will be useful in further refining the vegetation mortality map contained within this plan and determining additional study sites, rehabilitation treatment measures or restoration goals for some sagebrush plant community areas.

Observations of sagebrush and native bunchgrass communities were made to determine fire effects to native species. Acreage totals and vegetation loss estimates are outlined in TABLE A below for major plant associations:



TABLE A:

Species	Acres w/in Fire Perimeter	Remnant (Acres)	25-50% loss (Acres)	50-75% loss (Acres)	75-100% loss (Acres)
Big Sagebrush	53,713	8,600	9,096	10,901	25,116
3-Tipped Sage	10,382		9,909		473
Bitterbrush	1,437	7		11	1,409
Greasewood	298			298	
Bunchgrass / Cheatgrass	3,300				3,300
Bluebunch wheatgrass	28,144				28,144
Willow Riparian	44			14	30
Winterfat	1,102				1,102
Needle-and - thread	593			593	

Vegetation resources provide valuable wildlife forage and habitat, watershed protection, and comprise a visually pleasing landscape. The effects of this fire will have both positive and negative short and long-term influences on these plant communities and in the natural regeneration processes of the impacted watersheds.

## 2. Vegetation/Structural Impacts

Vegetation resources were directly impacted by the 24 Command Fire and by suppression tactics utilized to control the fire. Documented impacts to vegetation resulted from:

- a) Construction of dozerline on previously undisturbed sites and the grading of 2-wheel track roads on ALE.
- b) Impacts to native shrub, and grass species during line construction, suppression and mop-up activities.
- c) Reduction of fuels and vegetation ahead of the fire-front (backfire operations).

- d) Vegetation losses due to fire intensity. Most sagebrush communities were completely consumed and/or scorched. Some additional loss is expected within remaining shrub communities.
- e) Loss of the organic litter layer on approximately 95 percent of the fire.
- f) Impacts to riparian vegetation by fire effects on riparian species.
- g) Loss of sagebrush plantations established in 1998 and 1999 through backfire operations.
- h) Damage to structural improvements, (e.g. boundary fence) by suppression actions. Fences were cut or damaged through backfire operations. (Detailed information and locations available within Operations Assessment).
- i) Impacts to established research plots throughout ALE.

Generally speaking, most sagebrush and bunchgrass communities experienced greater than 75% vegetative loss. On approximately 85% of the fire area, complete consumption of vegetative resources was observed. Most shrub, grass and forb species and organic material on the soil surface was consumed indicating extreme fire intensity.

The vegetation specialist tested the soils for hydrophobicity in several sagebrush plant communities to determine if a water repellant layer was present in the soil. On sagebrush sites where the sage was estimated to be 30- 50 years old, a hydrophobic layer existed for approximately two inches into the soil surface. It is believed that this layer was present due to the amount of accumulated organics at the base of the shrub and the presence of cheatgrass. When the soils were tested in the interspaces between shrubs, where a well developed microbiotic crust existed, there was absolutely no water repellence. This observation is relevant only in the fact that cheatgrass accumulation acted as a ladder fuel to ignite the sagebrush. Historically, sagebrush burned in a more mosaic fashion without entire stands being consumed. The hydrophobic layer was created through the intense heat and residency time of the fire in these areas. This example of hydrophobicity was limited in scope (please refer to Watershed Assessment of detailed evaluation of burn severity) throughout the fire area.

Due to the fact that the fire moved so quickly with a low burn severity, seed bank sources in the soil were not adversely impacted. That is, the seed bank within the soil will serve to naturally regenerate sage and native bunchgrass species. Recovery times of sagebrush will be dependent upon growing conditions and precipitation patterns over the next several years. Recovery is expected to take between 5 to 10 years to establish a visible sagebrush cover on the landscape. However, some sage communities may not recover or be replaced by other species (i.e. *Artemisia tridentata* with *Artemisia tripartita*). Population sizes may have been adversely impacted and should be monitored over time to determine long-term fire effects.

A mosaic burn pattern was observed and mapped on approximately 15% of the fire area. Some remnant plant communities on Rattlesnake Mountain, Yakima Ridge, and near the LIGO facility on DOE are still intact.

Bunchgrass communities were impacted almost uniformly across the landscape. Except for the areas as described above in the mosaic burn areas, 90% of all bunchgrass species were burned. A random sample was made across ALE to estimate the survival rate of bunchgrass species. The vegetation specialist found a good age class distribution for bluebunch wheatgrass between plant communities. In the older bunchgrass stands, approximately 3-4 inches of burned biomass remained above the crown of the plants. Individual plants were checked to determine if fire residency time had killed the crown. On older

bunchgrass species, the center of the plant where litter accumulations were present burned at a higher intensity than the outside “ring” of the plant. Younger plants burn more uniformly across the crown due to low litter buildup in the center of the plant. In both cases, live crowns were still present on these species. Older plants will regrow as adequate moisture is received and will have a “halo” appearance. Younger plants are expected to readily recover.

As discussed within the T&E plant assessment, most forb species were consumed. Although the fire burned at varying intensities across the landscape, in most cases the residency time of the fire was short enough so as not to damage the soil, existing root systems, or reduce native seed banks in the known habitats of these plants.

Riparian areas within Snively, Rattlesnake Springs, and along the Yakima River experienced losses ranging from 50% to approximately 80% of riparian vegetation. Approximately 14 acres or 32% of the riparian areas along the Yakima River experienced 50-75% loss of riparian vegetation. Snively Springs and Rattlesnake Springs experienced a 75 -80% loss of riparian vegetation in and around the spring sources and along the stream channel. Concern has been expressed by tribal representatives concerning the impacts to remaining and recovering riparian areas by the elk population. Potentially, additional grazing or trampling impacts will occur to these areas due to the loss of the forage base for wildlife species on ALE. However this loss will be temporary in nature as willows and sedges will revegetate these areas over the next 2-3 years. Impacts to riparian areas by elk will be evaluated through monitoring efforts which will be conducted within the burn. This issue is discussed further within the Wildlife Assessment. Findings from monitoring actions will determine if additional rehabilitation treatments or mitigation measures are required for riparian recovery.

Ground disturbing impacts to ALE and DOE property came in the creation of fire breaks using bull dozers and graders. A complete inventory was conducted of dozerlines on the fire area and rehabilitation needs assessed. Roads within ALE that had revegetated over time were also opened up using graders and utilized as firelines and transportation routes for suppression personnel.

Negative impacts resulting from vegetation losses include a significant reduction in wildlife habitat, forage for wildlife species, visual quality degradation, increased non-native invasion potentials, bare soils, and reduced species diversity. The loss of wildlife habitat, and potential impacts to Threatened and Endangered Species are discussed further within the Wildlife Assessment.

Additional losses surveyed during field reviews were fire impacts on boundary fences. Boundary fence between ALE and private lands were negatively impacted. Stretch posts and wire were damaged by the fire and will require repair. Some repairs were completed by the Operations Specialists of the BAER team to secure boundary fences along US Highway 240. Additional repairs have been addressed within the Operations Assessment (Appendix I).

## **B. Vegetation Recovery**

Revegetation of the fire area through natural processes will take between 3-7 years to visually represent pre-fire conditions. Some impacted plant communities will take decades to re-establish back to pre-fire levels. Most research indicates that fire will eliminate sagebrush for at least several years. Because big sagebrush reproduces by seed and not by sprouting, recovery can be very prolonged on many sites. In most cases, sagebrush eventually returns. However, concern has been expressed about the re-establishment of critical sagebrush communities for agency listed T&E wildlife habitat and the protection of the ecological integrity of the shrub-steppe community. During the course of the fire, backfires were set (see Suppression Impact Map- Appendix III) to slow or stop the advancing fire front. In initiating this type of suppression action, shrub communities

established through plantings in 1998 and 1999 were lost. As the backfire progressed on ALE and DOE lands, sagebrush communities established for restoration and mitigation purposes were consumed. Additionally, native shrub-steppe habitat was lost thereby creating potential short and long-term impacts to T&E plant and wildlife species.

Currently the USFWS and DOE have a cooperative outplanting program for sagebrush tublings. Approximately 80,000 plants have been propagated from locally collected native seed and are available for planting this fall. Rehabilitation work through the years at Hanford has shown that tublings have the best survival rate for rehabilitation over seeding or bare root stock plantings. In order to facilitate the recovery of critical wildlife habitat it is recommended that the Agencies cooperatively identify critical habitat needs and areas for outplanting of these tublings within the fire area this fall.

Additionally, in order to carry out the mission for the protection and preservation of the shrub-steppe communities in perpetuity it is recommended that USFWS and DOE work cooperatively to restore those plantations that have been lost through fire suppression activities. During the 2000 calendar year, it will be necessary to assess overall losses to sagebrush communities as a result of suppression actions; collect native seed for sagebrush propagation; and establish native outplanting stock for rehabilitation efforts.

One plant community comprised of Black greasewood was observed during field assessments. One-half of this plant community lost approximately 70% of standing shrubs whereas the other half, along the southern foothills of Yakima Ridge, suffered a 30% loss. This species had been mentioned as a species of concern for Native American Tribes. The thorns on this shrub are used for sewing. In order to determine potential effects to this population, the vegetation specialist consulted the Fire Effects Information System (FEIS) to understand fire impacts to this species. The current research indicates that greasewood generally sprouts vigorously from the stem base or roots following fire. Rapid resprouting may lead to an increase in stem density. A similar response may occur after the plant is partially killed by fire. Follow-up evaluations of the ALE population should be conducted to determine direct effects to this plant community.

It will be necessary to also assess and determine rehabilitation actions to be taken on dozerlines and road systems within ALE and DOE lands that were impacted by suppression actions. During the 2000 calendar year it will be necessary to finalize rehabilitation plans for dozerlines and suppression impacts to roads, collect native grass and shrub seed and establish native outplanting stock for rehabilitation efforts.

Other direct impacts to vegetation include the loss of shrub lands previously occupied by dense vegetation which are now open and traversable. Increased visitor/research use into areas off of designated road systems can be expected and could have negative impacts to wildlife, microbiotic crusts, vegetative recovery, and cultural resources. Impacts to natural regeneration process and the protection of cultural resources will be jeopardized if travel within the fire area is not regulated for the remainder of this calendar year.

Soil samples collected within the burn on July 2, 2000 were watered for a five day period during the BAER Team's assessment phase and on July 8, 2000 sprouted seedlings. This demonstrates that the seed bank within the fire area is still intact and will respond quickly to the first measurable precipitation.

Recovery of native plant communities, impacts of the fire on microbiotic crust, re-establishment of sagebrush, invasive species and noxious weed monitoring, and long-term fire effects to this Columbia Basin shrub-steppe ecotype within the region all present tremendous research opportunities. A tremendous interest has been expressed concerning research opportunities to tie treatment specifications with data collection to advance ecological knowledge for supporting management actions and

decision making processes (refer to Washington State University letter dated July 7, 2000- Appendix V). The ALE has been designated as a Natural Research Area and thereby possess special characteristics and guidelines for research and study opportunities. A window of opportunity is now available for research plots within ALE and Central Hanford to be reactivated to capture baseline recovery data. However, this work must be closely coordinated to ensure that research efforts do not hinder site recovery or natural regeneration processes.

#### **1. Noxious Weed Establishment**

During the initial BAER Team briefing, the concern of invasive species introduction into the fire area was discussed with the vegetation specialist. Concern was expressed concerning species expansion on burned-over lands within ALE and Central Hanford.

The establishment of invasive species and noxious weeds which will compete with native vegetation recovery is likely. Noxious weed establishment and spread is most likely to occur on disturbed sites such as dozerlines and open road systems.

During field assessment inventories, the vegetation specialist recorded sightings of diffuse, spotted, and Russian knapweed; rush skeleton weed, and kochia. Each of these species is currently located along existing road systems or in unburned islands of vegetation within the fire. Most of the knapweed species are beginning to blossom and will set seed by the middle to end of July. It is imperative to treat known populations prior to seed-set in order to reduce the expansion potentials of these populations into the fire area. Immediate treatment of these populations is recommended.

Additionally, disturbed sites within the fire area should be inventoried by each respective management agency utilizing funds allocated within this plan. Each agency should establish their own monitoring protocols and ensure that surveys are conducted during the fall of 2000 and 2001 calendar year. Upon the discovery of new noxious weed populations, accurate population information should be collected through the use of Global Positioning Systems to determine infestation size, original source and potential control methods. Control efforts will be implemented in accordance with Agency management guidelines and protocols.

#### **2. Revegetation**

Concern has been expressed concerning the loss of vegetative cover on the sand dunes area of ALE and Central Hanford along Highway 240. Conversations with the Washington Department of Transportation (WDOT) have been held to express the BAER Teams concern over public safety during the next 3 years. Options were offered to WDOT (see Watershed Assessment) to allow natural regeneration processes to occur prior to seeding. However, revegetation of the sand dunes will be slow and will take many years to stabilize these areas. WDOT has expressed a desire for the federal agencies to revegetate these dunes this fall. USFWS and DOE in conjunction with WDOT should continue to pursue this option and revegetate those areas as needed to protect public safety and critical natural resource values. Supplemental funding will be required as plans are finalized on treatment areas, methods, and locations.

### **IV. RECOMMENDATIONS**

#### **A. Management (specification related)**

The following recommendations are offered to assist in the timely recovery of 24 Command Fire:

1. **N-2: Non-native / invasive plant control-** Control noxious weed infestations remaining within 24 Command fire area prior to seed-set and maturation. Current weed species observed include Rush skeleton weed, knapweed (diffuse, spotted, Russian), kochia and Canadian thistle. Utilize integrated pest management techniques (herbicides, biological, mechanical and cultural control methods) as appropriate to prevent the spread and establishment of noxious weeds within the fire area (N-).
2. **N-3a: Ecological stabilization and sagebrush plantings -** Replace sagebrush plantations (*Artemisia spp.*) lost during backfire operations on the 24 Command fire to protect ecological integrity of ALE and DOE lands.
3. **N-3c: Ecological Stabilization and Seed Collection-** Collect seed from native sagebrush, bitterbrush, bunchgrass and greasewood populations for the establishment of nursery stock for rehabilitation efforts within the 24 Command fire area. Collection sites may be within Hanford, Ale, or adjacent project lands.
4. **N-3b: Ecological Stabilization and Sagebrush Outplanting-** In the fall of 2000, plant 80,000 sagebrush (*Artemisia spp.*) seedlings within the fire area to rehabilitate impacted shrub-steppe plant communities that serve as critical habitat for T&E species.

**B. Monitoring (specification related)**

1. **M-1a: Monitoring: Invasive Plant Species-** Develop monitoring protocols and conduct field inventories on disturbed sites including but not limited to dozerlines, handlines, safety zones, and helibases to map, and initiate control measures on invasive species infestations that threaten native plant community recovery as discovered.

**C. Management Recommendations(non-specification related)**

1. Initiate designated road closures within the 24 Command Fire area in order to prevent further road degradation, prevent the spread of noxious weeds and protect cultural resources.
2. Create informational articles for the public during the course of the rehab efforts to keep residents updated on progress. Continue to produce timely news releases to educate the general public about the shrub-steppe ecosystem developmental processes and recovery periods following fire.
3. Utilize the NRCS and RCD programs to assist with rehabilitation on private lands and information dissemination.
4. Establish a cooperative agreement with DOE for seamless implementation of rehabilitation treatments.
5. Finalize suppression damage inventories and initiate repairs to boundary fencelines and fire control lines.
6. Establish photo trend/vegetation monitoring plots in 2000 and 2001 to document vegetative recovery in each plant association within the fire area.
7. Evaluate sand dune rehabilitation in an interagency forum and develop additional seeding needs cooperatively.
8. Initiate a call-out for research proposals that will aid both agencies with data collection for long-term rehabilitation decision making.

**V. CONSULTATIONS**

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Greg Hughes, Project Leader, US Fish and Wildlife Service, Arid Lands Refuge Complex  
Steven O. Link, Washington State University Botany Department.  
Ed Rykeil, Ecologist, Washington State University Biology Department.

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**U. S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**24 Command Fire**

**WILDLIFE RESOURCE ASSESSMENT**

**I. OBJECTIVES**

- !** Assess effects of fire and suppression actions to Threatened, Endangered, Proposed and other significant agency listed species and their habitat, including birds, mammals, amphibians, reptiles, fish and insects.
- !** Initiate Emergency Section 7 Consultation as required by the Endangered Species Act.
- !** Assess effects of fire and suppression action to habitat improvements.
- !** Assess effects of proposed emergency rehabilitation actions to listed species and habitat.
- !** Prescribe emergency rehabilitation measures and/or monitoring.

**II. ISSUES**

- !** 14 agency listed species occur within the fire area, most of which are dependent on the shrub-steppe plant community.
- !** Potential effects to these species from the fire, suppression actions and potential post fire effects to down stream species.
- !** Potential effects to these species from proposed emergency rehabilitation actions.

**III. OBSERVATIONS**

**A. Background**

The purpose of this Burn Area Emergency Rehabilitation (BAER) Wildlife Assessment is to document the effects of the fire, suppression actions, proposed emergency rehabilitation work, and potential post fire flooding, to all federally listed, agency sensitive and culturally significant mammals, birds, amphibians, reptiles, fish, invertebrates, and their habitats which may occur within or downstream from the fire area. This assessment also includes documentation on Emergency Section 7 Consultation, as required by the Endangered Species Act, with U. S. Fish and Wildlife Service and National Marine Fisheries Service. The species list is included on page 13 of this report. This species list was developed by Heidi Brunkal, Wildlife Biologist, U. S. Fish and Wildlife Service (FWS), Arid Lands National Wildlife Refuge Complex (ALNWRC), and Larry Cadwell, Staff Scientist, Pacific Northwest National Laboratory (PNNL). Species occurrence discussed in this assessment is based on formal surveys and habitat inventories conducted prior to the 24 Command Fire, and post fire reconnaissance. Documents, inventory data, sighting records, vegetation maps and other species specific information referenced in this report are on file at the ALNWRC and PNNL offices.

The 24 Command Fire burned approximately 163,884 acres between June 27 and July 1, 2000. This fire was ignited by a vehicle accident the afternoon of June 27. By the evening of June 28, the fire had burned 138,074 acres. The fire was driven by high temperatures, high winds and low relative humidity. The fire was declared contained on July 1 and controlled on July 2. Land ownership affected by the fire includes approximately 78,732 acres of ALNWRC; 60,254 acres of Department of Energy (DOE) lands; 980 acres of Bureau of Land Management; 3,633 acres of State lands; and 20,285 acres of private lands.

Fire suppression actions included construction of 41 miles of dozer line which varied from one to four blades wide. No hand line or safety zones were constructed. Backfiring occurred on approximately 9,698 acres, all on ALNWRC. Air support included use of helicopters for water drops and use of air tankers for fire retardant drops. Water was dipped out of the Yakima River near the community of Benton City. Although fire suppression records indicate that substantial amounts of fire retardant were deployed throughout the fire area, post fire reconnaissance observations indicated that none was dropped in the Yakima or Columbia Rivers, and only one drop occurred in a riparian area (Snively Spring). Most of the existing roads within the ALE were used by suppression forces. Some dozer blading and grading occurred which removed vegetation from the road beds, widened the roads slightly (0 to 4 feet) and/or piled a berm of vegetation and soils along the road edges.

Vegetation resources were impacted to varying degrees as burn severity varied across the landscape. The majority of the fire resulted in low burn severity (defines effects to soils and hydrologic function of the affected watersheds), with a few small areas of unburned mixed in (see Soil and Watershed Assessment, Appendix I).

The fire resulted in removal of all or part of the vegetation and duff across most of the burned area. The overall fire effect to vegetation included approximately 141,075 acres of 75 to 100 percent mortality of all vegetation, 3,713 acres of 50 to 75 percent mortality, 18,863 acres of 25 to 50 percent mortality and 233 acres with none to less than 25 percent mortality. 44 acres of riparian habitat were affected by the fire. Loss of vegetation in wet areas included mortality of an average of approximately 60 percent of all vegetation within the riparian zones (reference Vegetation Mortality Map, Appendix III). A detailed account of fire effects to the vegetative resources is documented in the 24 Command Fire BAER Vegetative Resources Assessment (Appendix IV).

Elevation within the fire area ranges from 500 to 3,500 feet. The climate of the Hanford Site is dry, with the 6 to 13 inches of precipitation falling in autumn and winter. Summers are hot and dry.

Plant communities within the fire area include primarily big sagebrush/blue bunch wheatgrass, three tip sagebrush/blue bunch wheatgrass, bitter brush/Indian ricegrass, and big sagebrush dune complex. Several springs and associated short stretches of desert streams occur in the fire area and provide year around water sources. Vegetation in the riparian areas includes black cottonwood, mock orange, choke cherry, squawberry, blue elderberry, serviceberry, wild rose, bull rushes, peach-leaf willow, and several species of shrub willows. The only perennial water course in the fire area is the Yakima River, with the Columbia River to the north and east sides of the fire boundary. Many ephemeral drainages occur throughout the fire area. The last major wildfire which burned through the 24 Command Fire area occurred in 1984. Many smaller fires have occurred since then, including the 1998 Yakima Ridge Fire.

The Hanford Site is located in the Pacific Flyway. Habitats within the fire area serve as resting areas for neotropical migratory birds. The Hanford site includes habitat for many wildlife species, including 40 mammals, 246 birds, 4 amphibians, 9 reptiles, 49 butterfly taxa, 318 species of moths, and 52 taxa of aquatic macro invertebrates. Species diversity on the Hanford Site can be attributed to the size, diversity and relatively undisturbed condition of the native shrub-steppe habitat.

The portion of the Hanford Site that includes the north slope of Rattlesnake Mountain and lies south of State Highway 240 was actively used for ecological research by the Atomic Energy Commission (AEC) beginning in 1952. In 1967 the AEC designated the ecological study area as the Arid Lands Ecology (ALE) Reserve. In 1972 the ALE Reserve was also formally designated as the Rattlesnake Hills Research Natural Area. In 1977 the Energy Research and Development Administration further designated all open lands of the Hanford Site, including the ALE Reserve, as the "Hanford National Environmental Research Park." Thus, much of the land area involved in the 24 Command Fire has a rich use history for ecological research, science training and

education, and biodiversity protection through decades-long management as a Federal Research Natural Area.

The portion of the fire that occurred on DOE lands is administered as a former nuclear weapons production facility and radioactive waste disposal site.

The portion of the fire that occurred on the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE) is part of a National Monument designated for the primary purpose of protecting and preserving all of the species associated with the shrub-steppe ecosystem. The objectives of the ALNWR include participation in the national effort to preserve adequate examples of all major ecosystems types or other outstanding physical or biological phenomena.

## **B. Reconnaissance Methodology**

Information used in this assessment is based on a review of relevant literature, agency management planning documents, agency wildlife sighting and habitat inventory data, communication with FWS and NMFS, personal communication with agency biologists (listed at end of report), and reconnaissance of the fire area on July 1 through 3, 2000. Reconnaissance included a helicopter flight over the fire area on July 2. Field notes were recorded on Incident Command System Unit Logs (ICS Form 214) and included in the BAER file provided to the two agency representatives. Burn severity was mapped by the BAER Watershed Team, and vegetation mortality was mapped by the BAER Vegetation and Wildlife Specialists. Habitat information and mapping for the various species is based on agency records and post fire reconnaissance. Reconnaissance and analysis included review of other fires in the area to assess effects to species and vegetative recovery.

## **C. Findings**

To better understand the species and habitat information discussed in this wildlife assessment, it is important to review the 24 Command Fire BAER Vegetation and Watershed Resource Assessments. These reports contain more detailed descriptions of pre-fire vegetation, post-fire vegetative recovery estimates, and effects to the watersheds.

The purpose of this assessment is to discuss the potential effects of the fire, suppression actions and proposed emergency rehabilitation activities to federally listed and sensitive species which occur within the fire area. Effects to general wildlife species are not discussed. This assessment is not intended to definitively answer the many questions of effects to specific species that are inevitably raised during an incident such as the 24 Command Fire. The focus of this assessment is to determine the potential for immediate, emergency actions that may be necessary to prevent further effects to these species. Because the species discussed in this assessment have ranges or territories which extend beyond the fire area, it may be important to include information at a larger scale, across land ownership boundaries, for species which may require assessment for long term rehabilitation or restoration needs. This assessment does not include analysis or discussion of potential effects that may have occurred to DOE facilities or potential contaminant release sites. DOE and PNNL personnel are currently assessing this situation to determine potential effects from radioactive and chemical waste material to species and habitats occurring on DOE lands.

## **BIOLOGICAL EVALUATION**

Direct effects as described in this report refer to mortality or disturbance that results in flushing, displacement, harassment or mortality of the animal. Indirect effects refer to modification of habitat and/or effects to prey species.

## **SHRUB-STEPPE DEPENDENT WILDLIFE SPECIES**

The community of plants and animals found in this area represents the largest remaining example of the shrub-steppe ecosystem that once covered the Columbia River Basin. Termed a biological treasure, the monument contains rare, rich and diverse shrub steppe ecosystem flora and fauna that has been lost elsewhere due to habitat conversion, fragmentation and application of pesticides. The shrub-steppe ecosystem supports an unusually high diversity of native plant and animal species, including significant breeding populations of nearly all steppe and shrub-steppe dependent wildlife. This area serves a critical role in contributing to the local, regional, national and international ecological integrity of the shrub-steppe ecosystem. The area provides critical corridor links for shrub-steppe obligate species traveling between the Saddle Mountain National Wildlife Refuge Unit and the Yakima Training Range (YTR) habitat. These corridors represent some of the last remaining intact shrub-steppe communities in the Columbia Basin Ecoregion. Rehabilitation efforts are needed to maintain these corridors to facilitate movement of terrestrial wildlife. It is critical to the survival of the shrub steppe ecosystem to minimize fragmentation and loss of connectivity between these habitats.

While fire has played an integral role in the history of the shrub-steppe environment, the region's historical fire regime has been greatly altered from socio-political and economic factors. Coupled with the arrival of invasive species and noxious weeds, this has weakened the natural recovery processes of the shrub steppe ecosystem from disturbance events such as fire. The ALE provides rare and unique habitat that is critical for meeting FWS regional, national and ecosystem goals and objectives. Managing for biological integrity in this area necessitates that actions be taken to mitigate the ecological effects from years of fire suppression and invasion of exotic species.

The 24 Command Fire resulted in significant negative effects to this plant community through removal of approximately 85 percent of the sage brush and associated plants. The 69,244 acres of shrub-steppe plant community within the fire area represented approximately 10 percent of all shrub-steppe communities in the State of Washington. This area is considered to be the largest contiguous steppe area in the State. The sage brush is either a food source or provides nesting, resting, thermal and escape cover for a wide variety of species. Other value for wildlife includes the thick canopy which protects underscore vegetation that can be a valuable food source for wildlife. Wildlife species in the fire area that are dependent on the sagebrush shrub-steppe and have federal or state listing status include: Ferruginous hawk, burrowing owl, loggerhead shrike, sage sparrow, sage thrasher, western sage grouse, long-billed curlew, Merriam's shrew, pygmy rabbit, black tailed jack-rabbit, and striped whipsnake.

### **FERRUGINOUS HAWK (prepared by Heidi Brunkal)**

Ferruginous hawks are migratory raptors that occur on the Hanford site during the breeding season from early March through July. The incubation period is 28-33 days with fledging at 44-48 days from the date the egg is laid. Ferruginous hawks are known to breed on the Hanford site and on private land on the south slope of Rattlesnake mountain. There are 30 ferruginous hawk nests (16 nest sites) within Central Hanford, where they occupy power towers. There are 5 historical nests on the ALE Reserve (3 nest sites). Ferruginous hawks forage widely both on the site and in surrounding areas. In many areas the number of nesting pairs, number of eggs laid, and number of young fledged, vary in synchrony with small mammal abundance. Ferruginous hawks are listed as Threatened by the State of Washington and are considered a federal Species of Concern. Ferruginous hawks are sensitive to human presence, and will abandon their nests if subject to human encroachment. Activities (especially noisy ones) near nesting sites should be limited during the breeding and fledging season.

**DIRECT EFFECTS:** Ferruginous hawk were likely present during the fire. Twelve nest sites are located within the fire area. Adults and fledglings that were present during the fire are considered to be mobile and capable of escaping the affected area. Nest sites are located on electrical power towers at average heights of 20' to 40' and were probably not damaged by the fire.

Young may have fledged prior to the fire. However, recent fledglings are capable of only short flights and perch on the ground until they gain flight capability. It is likely that fledglings from nests in the burn area perished in the fire.

**INDIRECT EFFECTS:** The entire area affected by the fire is considered foraging habitat for Ferruginous hawks. Effects on small mammal abundance and distribution due to the fire will effect the foraging efficiency of these birds. The loss of shrub cover due to the fire will probably initially improve the foraging success of raptors and other predators, because hiding cover for prey species has been eliminated. However, this initial affect will be short term. Over a longer term, any negative impact to small mammal abundance will decrease foraging opportunity for Ferruginous hawks. Newly fledged juvenile birds will probably experience the greatest impact from changes in prey availability. It takes 2 years for Ferruginous hawks to reach adult maturity, and juvenile survival rates are relatively low. Changes in abundance of jackrabbits due to impacts from the fire may impact the number of nesting pairs, number of eggs laid, and number of young fledged within the burn area. Although it is unknown at this time, it is thought that ferruginous hawks will not return to historically used nests until prey availability returns to pre-fire conditions.

**POST-FIRE OBSERVATIONS:** No Ferruginous hawks were observed during post fire reconnaissance. Nest locations were not specifically checked for presence or absence of individual birds. PNNL does have data on ferruginous hawk presence from June 2000 surveys.

#### **WESTERN BURROWING OWL (Heidi Brunkal)**

Burrowing owls are small ground-dwelling species associated with dry, open, shortgrass, treeless plains, often linked with burrowing mammals. Presence of nest burrows is a critical requirement for the Western burrowing owl. Foraging areas are typically short grass dominated habitats, food items include predominately invertebrates and small mammals, and occasionally small birds and reptiles. Within the Columbia Basin, Western burrowing owls are migratory and are present from February through early August. Breeding locations of Burrowing owls have confirmed within the fire area. The Western burrowing owl is thought to be declining throughout central Washington and much of its range in North America. It is also apparently declining at the Hanford Site. Once thought relatively common, they are now rarely observed. The regional decline of ground squirrels, which provide nesting sites for these owls, is possibly linked with the apparent decline in owl populations. The potential decline in population is not unique to Hanford and may be characteristic of the species population trend throughout eastern Washington.

**DIRECT EFFECTS:** Two known nest locations were within the burn area. During the fire any burrowing owls that were present were probably affected by the fire. Although burrowing owls are mobile and can fly, their habit is to run and/or hop along the ground. During the breeding cycle, the owls are tied to their nest burrow locations and retreat to the burrow for protection from avian predators. The burrowing owls that were present during the fire may have been killed due to this behavior. Seeking refuge within the burrow, may have killed owls through heat and/or asphyxiation by smoke. Juvenile owls, if present, would have been approximately 4 weeks old. At this stage, they are able to make short flights. However, fledging does not occur until 44 days after the eggs are laid. At this stage young can fly well, however, behaviorally they remain near the nest burrow and will retreat into the burrow at any sign of danger. It is likely that any young produced during this breeding season would have been at the burrow during the fire and would have most likely taken refuge within the burrow. The young would have experienced the same effects as the adult owls within the burrow during the fire.

**INDIRECT EFFECTS:** Approximately 110,611 acres of burrowing owl habitat was impacted by the fire. Impacts to invertebrate and small mammal populations will have long term effects upon Western burrowing owls. The elimination of shrubs effectively

reduces almost all natural perch locations for burrowing owls. Further, elimination of shrub cover may expose small mammals to higher predation rates and consequently may reduce the local abundance of small mammals. Local population declines will impact burrowing owls in two ways; the number of available nest burrows will decline with associated decline in burrowing animals, and the prey availability will also decrease. A reduction of invertebrate prey, or changes in prey availability may impact the foraging efficiency of individual owls. Many dead invertebrates (beetles, grasshoppers, etc.) were observed during post-fire surveys at locations near nest burrows. The decline in prey availability has documented impacts on reproductive success. In one study, female owls that were artificially food supplemented laid more, larger eggs, and hatched more young than those not supplemented. Burrowing owls are also prey for other raptor species. Reduced plant biomass, and loss of cover could result in a higher predation rate on individual burrowing owls within the burn area. Additionally, burrowing owls are normally well camouflaged by their plumage, they now stand out dramatically against the blackened vegetation. This may also increase their vulnerability to predation. Shrubs are also important to burrowing owls as thermal cover, adults and juvenile owls seek thermal cover in the shade of shrubs during mid-day periods. Elimination of this thermal cover may increase the vulnerability of owls to stress related mortality. Finally, impacts to soil stability that may result from the fire may cause a higher probability of nest collapse, and potential nest locations may also become less abundant, if they collapse.

**POST-FIRE OBSERVATIONS:** Known burrow locations within the fire area were checked for presence of owls on July 4, 2000. One adult owl was present at one of the known burrows, no owls were present at the second burrow location. The interior of the burrows were scoped with a video surveillance system. The burrow where the adult owl was present had egg shell fragments within the burrow, but no juvenile owls were located. The other burrow had no evidence that it had been used for a nesting attempt during this breeding season.

#### **GOLDEN EAGLE**

Golden eagles have been observed in the fire area in the past and are considered to be a year round, uncommon species. No nests have been located.

**DIRECT EFFECTS:** If golden eagles were present during the fire, they would have been temporarily displaced due to the fire and suppression actions, including use of helicopters

and airplanes. If a nest occurred in the fire area, it may have burned and the occupants killed.

**INDIRECT EFFECTS:** Potential nest structures were probably unaffected by the fire (cliffs, large power poles). Prey species that were dependent on the shrub-steppe plant community were greatly reduced. However, remaining prey species will have less vegetation to use for hiding cover, therefore hunting for prey items may be easier for golden eagles. Carrion may be more available in the short term.

**POST FIRE OBSERVATIONS:** No golden eagles or potential nest sites were observed during post fire reconnaissance.

#### **LOGGERHEAD SHRIKE (Heidi Brunkal)**

The loggerhead shrike is a migratory passerine bird species that breeds in the Columbia Basin. Loggerhead shrikes frequent open habitats with short vegetation, interspersed with perch sites. Shrikes are predatory birds, and often "impale" their prey on spines or branches of plants, or on man-made structures such as fence posts or barbed wire. Preferred prey include arthropods, amphibians, small to medium sized reptiles, small mammals, and birds. Loggerhead shrikes are common on the Hanford site from early March until the end of August. After August numbers are reduced but individuals have been sited through early November. Loggerhead shrike nests are usually well hidden within trees and shrubs, averaging 0.8-1.3 meters

off of the ground. Loggerhead shrikes are confirmed breeders on the site. They breed widely within the sagebrush flats of Central Hanford and in remaining big sagebrush on the ALE Reserve. They also utilize mixed sagebrush-bitter brush in dune environments. Individuals are highly territorial and exhibit site fidelity to nesting territories. This species is considered a shrub-steppe obligate and is a Washington State Candidate and federal Species of Concern.

**DIRECT EFFECTS:** Loggerhead shrikes are mobile animals. It is anticipated that any adult birds that were in the area of the fire were able to move away from flames and probably were able to leave the affected area. However, due to their strong behavioral site tenacity, individual birds probably attempted to return to their territories following the fire. Juvenile shrikes exhibit predator avoidance by attempting to seek cover. If juvenile shrikes were present they probably attempted to find hiding cover within brush or trees. Juveniles may have been killed during the fire due to this behavioral characteristic.

**INDIRECT EFFECTS:** A total of approximately 55,449 acres of suitable sagebrush and bitter brush habitat was affected by the fire with approximately 75% loss of shrub plants overall. Shrikes require shrubs and riparian trees for both nesting and foraging. Many prey items are "impaled" by shrikes on trees and shrubs. Loss of shrubs will effect foraging efficiency, because there are fewer areas and sites for prey to be impaled. The elimination of shrub cover will have dramatic effects on the nesting habitat for shrikes within the burn area. Average territory sizes (information from California and Idaho) are 20.7-21.9 acres. Because shrikes exhibit fidelity to nesting territories, individuals that attempt to return to former territories in subsequent breeding seasons will find them void of nesting cover and structure. Additionally, displacement of individual breeding pairs into other areas may increase inter- and intraspecific competition for nesting territories. If suitable habitat areas were already occupied by breeding pairs, displaced pairs may not be able to locate territories, or will be forced to utilize marginal habitat types. Breeding success would likely decline for pairs that have been displaced by fire impacts to their breeding habitat.

**POST FIRE OBSERVATIONS:** Loggerhead shrikes were observed during post fire reconnaissance. Individual birds were observed perched on the power line near gate 118, near the junction of 1200 Foot Road and Benson Ranch Road on remaining sage, and flying along the Army Loop Road on Central Hanford. The observed individuals were apparently attempting to forage along edges of the burned area, or near small patches of unburned vegetation.

#### **SAGE SPARROW (Heidi Brunkal)**

The Sage sparrow is a migratory sparrow present in the Columbia Basin during the breeding season from early February until the end of September. Sage sparrows prefer semi-open habitat with evenly spaced shrubs 1-2 meters high. This species is associated with sagebrush throughout its range. Sage sparrows forage on the ground for seeds and invertebrates. On the Hanford Site, sage sparrows are abundant in areas that retain big sagebrush communities. The Hanford Site, along with the Yakima Training Center to the west, support the largest contiguous habitat patches in Washington for this state Candidate species. Exceptional habitats with apparent high densities of Sage Sparrows are found in big sagebrush stands along the base of the Saddle Mountains, throughout sagebrush habitats on the Columbia River plains, within Central Hanford, and on the ALE Reserve. Sage sparrows are confirmed breeders on the site, and they frequently raise more than one brood per season. They are territorial and exhibit site fidelity to nesting territories. Flocks of juveniles are frequently observed along roadsides from late May throughout the beginning of August.

**DIRECT EFFECTS:** Adult sage sparrows had probably initiated their third nesting effort, these nests were probably destroyed by the fire. Although sage sparrows are mobile animals, their individual behavioral site fidelity to their nesting territories may have increased their susceptibility to direct loss during the fire. Large flocks of juvenile sage sparrows had recently been observed on ALE reserve. These recently fledged birds may have been displaced due to the fire.



**INDIRECT EFFECTS:** Approximately 53,713 acres of big sagebrush vegetation within the burn area experienced mortality of 80 to 100 percent of the sagebrush plants. Therefore, all of the available sage sparrow habitat in the fire area was lost due to the fire. Due to the loss of shrub cover, adult birds with established territories probably returned to a highly altered habitat condition. These birds were probably displaced due to the fire. Because sage sparrows exhibit fidelity to nesting territories, individuals that attempt to return to former territories in subsequent breeding seasons will find them void of nesting cover and structure. Additionally, displacement of individual breeding pairs into other areas may increase inter- and intraspecific competition for nesting territories. If suitable habitat areas were already occupied by breeding pairs, displaced pairs may not be able to locate territories, or will be forced to utilize marginal habitat types. Breeding success would likely decline for pairs that have been displaced by impacts to their breeding habitat from the fire. Because sage sparrows require open areas and bare ground for foraging, changes in vegetation structure and loss of sagebrush due to the fire will impact foraging by sage sparrows. Sage sparrows abandon former habitats once they become invaded by cheatgrass. Thus, replacement of native vegetation by cheatgrass in areas disturbed by the fire will decrease the available habitat for sage sparrows.

**POST FIRE OBSERVATIONS:** Only one sage sparrow was observed during post fire reconnaissance of the area. This was a dramatic decline from pre-fire observations made this year. Sightings during June (2 site visits) averaged 22.5 sage sparrows detected per visit within the fire area.

#### **SAGE THRASHER (Heidi Brunkal)**

Sage thrashers are a migratory species present on ALE in low numbers from early April through September (breeding unconfirmed). The Washington State Candidate Sage Thrasher is found at Hanford primarily in higher elevation habitats on the ALE Reserve in remnant patches of big sagebrush and three-tip sagebrush. They are essentially absent from the lower elevation Central Hanford.

**DIRECT EFFECTS:** Sage thrashers are mobile animals and would have been able to move out of the fire area. The majority of the known locations of sage thrasher within the burn area are in the three-tip sage zone at higher elevations. These areas were near the western edge of the burn and it is likely that sage thrashers could have found refugia adjacent to the affected area. Therefore there may have been no direct effects to sage thrashers.

**INDIRECT EFFECTS:** A total of 10,382 acres of three-tip sage brush habitat within the burned area experienced an mortality of 80 to 100 percent of the sage brush plants. The elimination of three-tip sagebrush at higher elevations of the fire area will have long term impacts for sage thrashers. All available habitat, mature three-tip sage brush, was impacted by the fire. Long term effects would include displacement of sage thrashers from the burn area. It is anticipated that this species will not return until the three-tip sagebrush recovers to maturity and provides the necessary habitat structure to support sage thrashers. It is unknown if potential re-colonizing populations exist nearby

**POST-FIRE OBSERVATIONS:** No sage thrashers were detected during post fire reconnaissance.

#### **WESTERN SAGE GROUSE (Larry Cadwell)**

Western sage grouse listed as Washington State threatened and a federal species of concern. Two small, disjunct remnant populations of sage grouse occur in Washington State. One population is in Douglas County approximately 75 miles north of Hanford, and the second is on the Army's Yakima Training Center (YTC) in Yakima and Kittitas Counties just north of the Hanford Site. The Douglas County population is estimated at 600 - 700 birds and the YTC population at 300 - 400 birds. As recently as 1999 the YTC population appears to have begun to expand into that portion of the monument included in the ALE Unit. Several sage grouse sightings were made in 1999 and 2000 in the vicinity of Rattlesnake Springs and Benson Ranch.

Western sage grouse nesting habitat in southeastern Washington is primarily sagebrush-steppe vegetation that is of relatively high quality (dominated by native species). Sagebrush intermixed with tall bunch grasses provides cover required for successful nesting. Brood rearing habitat includes the shrubs and tall grasses for escape cover, but also must include a mix of native forbs that provide both insects and high protein vegetation. Sage brush is an essential element for sage grouse during the late fall, winter and early spring, when the leaves of sage make up as much as 99% of the birds diet.

An interagency working group was established in 1998 to assist with the recovery of the sage grouse in Washington. Several agencies (U.S. Army, U.S. Fish and Wildlife Service, the Washington Department of Fish and Wildlife and the Department of Energy and the Yakama Nation) are working to preserve and restore sage grouse in eastern Washington State. It is noteworthy that the Hanford Site property (ALE Unit) was identified as one of the few large land areas having contiguous and high quality habitat suitable for sage grouse recovery and expansion. The recent 1999/2000 sighting confirmed that observation and provided optimism that ALE Unit lands would provide for expansion of the YTC breeding population. Prior to the 24 Command fire, sage grouse habitat on ALE provided probably the single best hope for expansion of the YTC breeding population. The Nature Conservancy concluded in their "Biodiversity Inventory and Analysis of the Hanford site" that "successful re-establishment of the Washington State Threatened Western Sage Grouse on the Hanford Site will depend on maintaining or developing extensive stands of mature big sagebrush / bunchgrass communities in proximity to riparian areas and open grasslands."

**DIRECT EFFECTS** include mortality of both adults and young that were unable to escape the flames. The fire occurred during the brood rearing season. Young chicks were out of the nest but unable to move quickly or to move great distances from the nest. Any animals that did escape the fire would have experience stress from that flight. The 24 Command Fire approached and burned through the area with recent sage grouse sightings from the north and west, which would have cut off the most likely escape corridor leading back toward the YTC.

**INDIRECT EFFECTS** include loss of habitat (nesting habitat, winter and summer shelter habitat, escape cover losses and food resources lost). Sage grouse on ALE at the time of the 24 Command Fire would likely have been forced to flee to the south and east, where there is little or no suitable habitat. Lands to the south and east include agricultural lands and lower elevation lands in central Hanford, which were extensively burned in 1984 and are unlikely to contain sufficient habitat to sustain sage grouse. In addition, the forbs and invertebrates which are the preferred food for this species were effectively eliminated throughout most of the fire area.

Regionally, the loss of 64,095 acres of sagebrush habitat represents a significant decrease of suitable habitat for this species. This habitat loss may delay or prohibit recovery of the western sage grouse in the State of Washington.

Due to the significant amount of habitat lost, and because any remaining sagebrush does not occur in the large blocks apparently needed for survival, it is expected that this area will not support sage grouse for 30 or more years. The arid nature of the site may further delay recovery because germination and growth of shrub species depends upon amount and timing of available moisture.

**POST FIRE OBSERVATIONS:** No sage grouse were observed during post fire reconnaissance.

#### **LONG-BILLED CURLEW**

Long-billed curlews are known to nest within the fire area. They select sparse, mixed stands of bluegrass and cheatgrass, or

pure cheatgrass, for nesting. Such stands occur in places where fire or other disturbance previously destroyed the shrubs.

**DIRECT EFFECTS:** If long-billed curlew occurred within the fire area, they may have experienced displacement. It is expected that adults could have flown out of the fire area. However, young birds, if still in the nest or in early stages of fledging, would not have been able to escape effects of the fire. From recent surveys within the fire area, it is known that the young are very small and have just fledged from the nests. It appears that this years young would not have survived this incident.

**INDIRECT EFFECTS:** Because this species nests in grasses, the current year nesting habitat within the fire area was removed. In subsequent years, because grasses will return as early seral species in areas where brush was removed, potential breeding habitat may be increased. Prey species were decreased by the fire. However, this decrease in insects should be only temporary. Prey abundance should be approximately the same as before the fire by the time the next breeding season occurs. However, the types of insects, and species diversity, may change.

**POST FIRE OBSERVATIONS:** No long-billed curlews were observed during post fire reconnaissance.

#### **MERRIAM'S SHREW**

Merriam's shrew prefers dry habitats and is generally found in sagebrush and grasslands of Western North America. On the Hanford site, this species has been documented to occur in association with three-tip sage brush at the higher elevations on the ALE. The Merriam's shrew uses burrows created by the sagebrush vole and other burrowing mammals. The diet of this shrew includes caterpillars, beetles, crickets and wasps. Shrews have exceedingly high metabolism and must feed frequently both day and night. Shrews are generally solitary except for short periods during the breeding season (spring). Shrews are preyed upon by owls, snakes and some mammals.

**DIRECT IMPACTS:** The Merriam's shrew was probably present within the affected area during the fire. Because of it's subterranean habit, it may have been protected by being under ground during the fire. Alternatively, this animal may have been killed through heat and/or asphyxiation by smoke.

**INDIRECT IMPACTS:** Due to the direct impact to invertebrate prey within the burn area, prey availability for shrews was probably dramatically decreased. Because of the metabolic needs of the Merriam's shrew, and it's requirement to forage nearly constantly, it is possible that many of these animals died shortly after the fire due to a lack of prey to meet energetic demands. Insects found within the ground would still be readily available, and insects above ground will quickly repopulate the fire area. However, the species abundance and diversity may have changed from pre-fire conditions.

**POST FIRE OBSERVATIONS:** No shrews were seen during post fire reconnaissance. However, a the observed loss of three-tip sage brush habitat indicates that the shrew population in the area probably was affected by the fire impact.

#### **PYGMY RABBIT**

This species is extremely rare in Washington, occurring only in the Great Basin portion of the Lower Columbia Basin. The pygmy rabbit is limited to habitat types which contain tall dense sagebrush. Field observations of the pygmy rabbit indicate heavy reliance on sagebrush, primarily the seed heads and vegetative leaders. Pygmy rabbit diet is comprised of 99% sagebrush in winter and 51% in summer. A pygmy rabbit colony was last observed on the Hanford Site in 1984 before a large fire burned off much of the sagebrush on the Site. Prior to that event, a small population was located on Rattlesnake Mountain, above Snively Springs. Subsequent to 1984, surveys for small mammals have resulted in no observations of pygmy rabbits.

**DIRECT EFFECTS:** If pygmy rabbits were present during the fire, they may have been temporarily displaced. Because the fire was mainly wind driven, rabbits that could not out run the fire may have been overcome if unable to find shelter in burrows.

**INDIRECT EFFECTS:** Field observations of the pygmy rabbit indicate heavy reliance on sagebrush, primarily the seed heads and vegetative leaders. Pygmy rabbit diet is comprised of 99% sagebrush in winter and 51% in summer. The pygmy rabbit is limited to habitat types which contain tall dense sagebrush.

**POST FIRE OBSERVATIONS:** No pygmy rabbits were observed during post fire reconnaissance. Observations included fire scars to plants, rocks and soils which indicate how the fire moved through areas at a high rate of speed. Consumption of the majority of the sagebrush, with few remaining islands which might have provided refuge during the fire and will now provide the only remaining habitat until the sagebrush returns.

#### **BLACK-TAILED JACK RABBIT (Heidi Brunkal)**

The black-tailed jackrabbit was once abundant throughout the Columbia Basin. Recent precipitous declines in populations of these hares have raised concerns regarding its distribution and status throughout the region. This species is closely associated with the sage brush steppe ecosystem. Black-tailed jackrabbits rely on sage brush structure for breeding sites and hiding cover, and require sage-brush vegetation as forage during winter months. Hares, unlike rabbits, do not use burrows. They place their young in shallow depressions in the soil called "forms". Jackrabbits are generally solitary and primarily nocturnal. They are vulnerable to predators including, coyotes, bobcats, foxes, hawks, owls, and snakes. Loss of habitat due to agricultural and human development has impacted jackrabbit populations. The fragmentation and isolation of populations residing within remnant habitat areas, has probably increased their vulnerability to stochastic events (e.g. severe weather, disease, fire, etc.) and has limited the re-colonization of areas that could potentially support jackrabbit populations.

**DIRECT EFFECTS:** Black-tailed jackrabbits are known to be relatively fast moving animals. Because these animals are highly mobile, it is anticipated that they would have been able to move out of the way of the fire. Young rabbits, however, if present may have been overwhelmed by the fast moving fire.

**INDIRECT EFFECTS:** The loss of sage brush structure and cover reduces the amount of hiding cover for this species, and will increase the vulnerability of jackrabbits to predation. Additionally, the loss of a significant continuous stands of sage exacerbates this effect, because smaller patches do not provide escape cover. If jackrabbits are chased out of the remaining small patches of cover, they will be forced into the open burned over areas and be easily captured and consumed. Impacts to the local jackrabbit population will also affect those animals that prey on jackrabbits, as jackrabbit numbers decrease, there will be less forage for other animals that prey upon jackrabbits.

**POST-FIRE OBSERVATIONS:** Two black-tailed jackrabbits were observed during post fire reconnaissance. These animals were located near a small patch of remaining unburned sage brush. It appeared that these individuals were seeking cover within the unburned portions of the fire area.

#### **ELK (Heidi Brunkal)**

Elk first appeared naturally on the ALE in 1972. Those using the ALE are a part of a larger population referred to as the Yakima Herd which populates the Rattlesnake Hills from the ALE west to Yakima. Although elk are not traditionally found in sage brush steppe habitats, zooarchaeological evidence suggests elk historically inhabited the arid Columbia Basin, but were hunted to extinction by 1850. The Rattlesnake hills elk have shown a consistently high level of productivity over the 17 years that data

has been collected. The average calf/adult cow ratio over the period of measurement was 58/100. The long term (1983-1993) growth trend for the Hanford elk herd averages a 20% increase annually, indicating that the sage brush steppe ecosystem is excellent habitat for elk. The herd is attracted to ALE by high quality habitat and a lack of disturbance. Hunting has not been allowed on ALE, and there is only limited public use, mostly research activities. As a result, when hunting begins outside ALE, all of the elk in the area move into the sanctuary provided by ALE. In 1998 the estimated calf production of approximately 150 brought ALE elk numbers to about 750. The increasing herd size has increased local concern regarding elk depredation of agricultural crops in areas surrounding ALE. During the winter of 1999/2000, 175 elk were removed from the herd and relocated to other areas within the state. The population at the time of the fire was assumed to be approximately 575 adult animals with the potential of 130 calves present. The elk distribution during early summer has traditionally been in the higher elevation areas of ALE. The elk were using these upper elevation areas for calving during the two to three weeks prior to the fire.

**DIRECT EFFECTS:** Elk are highly mobile animals, and it is anticipated that they were able to move out of the affected area during the fire. Recently born calves, however, may not have been able to move out of the way of the fire, although no mortality of elk calves was documented following the fire.

**INDIRECT EFFECTS:** The greatest impact to elk within the burn area is loss of available forage. Due to the timing of the fire, it is not anticipated that any appreciable rain fall, and therefore any regrowth of grasses, will occur over the next 5 months (November). Impacts of the elimination of above ground forage species within the burn area may be two fold; 1) Elk will forage off of the burn area on private lands. This will continue to exacerbate the problem of depredation of agricultural crops (wheat, alfalfa, orchards and vineyards); 2) Elk may experience nutritional stress related to the decrease in forage availability. Lactating cows may be at the greatest risk of this type of stress because of the energy demands that lactation produces. Additional indirect impacts to the elk include exposure to collisions with vehicle traffic within and adjacent to the fire area. As the elk move into different areas seeking forage, they are likely to cross Highway's 240, 225, 24 and 221.

An additional indirect effect may be that if elk continue to remain on private lands during the late summer and fall seasons, this herd will experience greater vulnerability to hunting pressure during the upcoming hunting season. Private lands surrounding the ALE area are open to elk hunting. If elk move into Central Hanford, they will be a cause of concern for Hanford facilities operations, particularly if they move onto the BC-Cribs radiation control zone.

**POST FIRE OBSERVATIONS:** During post fire reconnaissance, elk were observed within and adjacent to riparian areas (Upper Snively). Young elk still had spots, indicating they are less than 4 weeks old. Two bull elk were struck and killed on Highway 240 southeast of the burn area during the early morning of July 4, 2000.

#### **MULE DEER (Heidi Brunkal)**

Mule deer are a common resident ungulate of the Hanford area. The areas of highest density are on the ALE and along the Columbia River. The deer population in the Hanford area is relatively stable. Deer frequently move offsite and are killed by hunters on adjacent public and private lands. Mule deer are primarily browsers and rely on riparian vegetation and bitter brush for browse. Hunting has not been allowed on any Hanford lands exclusive of the former Waluke slope wildlife recreation area north of the Columbia River, and there is only limited public use consisting primarily of research activities. Many of the mule deer on the ALE and Central Hanford reach unusual size, with many animals in older age classes due to the sanctuary that the area provides.

**DIRECT IMPACTS:** Mule deer are highly mobile animals, and it is anticipated that they were able to move out of the affected area during the fire. Recently born fawns, however, may not have been able to move out of the way of the fire, although no

mortality of deer fawns was documented during post fire reconnaissance.

**INDIRECT IMPACTS:** The greatest impact to mule deer within the burn area is loss of available forage. Many of the riparian areas and springs were impacted by the fire. Estimated losses within riparian vegetation are 80-100%. Because of available water, these areas may recover some of their vegetation over the next several months. A large portion of bitter brush (1,437 acres) was also lost within the burn area, which decreases the available browse for deer. Regrowth of grasses in upland areas is not anticipated until fall rains begin, possibly in November. Mule deer will forage off of the burn area on private lands, however, because deer are more solitary than herding ungulates (elk) agricultural depredation is not an issue with deer. However, vulnerability to hunting mortality will be increased if deer remain off of the burn area into the late summer and fall hunting season. Private lands adjacent to the burn area are open to hunting. Additionally, deer may also experience some nutritional stress due to loss of forage during the fire. Lactating does may be at the greatest risk of this type of stress because of the energy demands that lactation produces.

**POST FIRE OBSERVATIONS:** Deer were observed throughout the fire area during the aerial and ground post fire reconnaissance.

#### **STRIPED WHIPSNAKE**

Striped whipsnakes occur in the Columbia Basin of Central Washington up to 1,985 feet elevation. It is rare throughout most of the Washington portion of its range. Habitat for this species is low elevation arid regions with scattered vegetation and open rocky areas. Mating occurs in the spring with eggs being deposited in June. Eggs hatch in the late summer or early fall. This species has been documented to occur at the Hanford site.

**DIRECT EFFECTS:** If present during the fire, striped whipsnakes could have experienced mortality if unable to move quickly or find a burrow. Those that survived would experience temporary displacement. Eggs exposed to heat would have been rendered unviable. Suppression actions which included blading of soils to remove vegetation may have exposed nest sites, thus exposing eggs to environmental conditions and predators.

**INDIRECT EFFECTS:** Prey species are primarily lizards, but may include rodents, bats, frogs, birds and other snakes. Habitat for any of these types of species within the fire area was greatly reduced. Therefore, prey species may be less available for the striped whipsnake until the habitat recovers and is repopulated by the various prey species.

**POST FIRE OBSERVATIONS:** No snakes were observed during post fire reconnaissance.

#### **HABITAT IMPROVEMENTS WITHIN THE FIRE AREA**

There were no structural improvements for wildlife within the fire area. Several research and monitoring sites were burned through. Other habitat improvements within the fire area, including sage brush plantings located approximately in the middle of the ALE portion of the burned area. Plantings occurred in November 1998: Approximately 75,000 sagebrush in 25 plots covering about 200 acres; and December, 1999: Approximately 51,000 sagebrush across about 130 acres.

Springs within the fire area were not developed for wildlife use.

#### **24 Command Fire Species List**

On July 3, 2000, current species lists for the 24 Command Fire area were obtained from U. S. Fish and Wildlife, U. S. National Marine Fisheries Service, and the Washington Department of Fish and Wildlife. In addition, the species list from the *Final Hanford Comprehensive Land-Use Plan environmental Impact Statement* (1999) was reviewed.

On June 9, 2000, President Clinton directed the FWS to manage the Hanford Reach National Monument to protect all of the species associated with the shrub-steppe ecosystem. The Department of Energy is directed to, "Preserve sensitive habitat and species identified through monitoring efforts." This includes species with federal, state or agency listed status or species of concern (Arid Lands Ecology Facility Management Plan, 1993). Included in the Memorandum of Understanding between FWS and DOE for management of ALE is, "The primary objective of the FWS is to ensure that the ALE is operated and managed for the protection and preservation of the native shrub-steppe habitat and its associated wildlife species." The federal agencies are also charged with managing for species of importance to the Tribes. Consultation with the Tribal representatives occurred between July 2 and July 6, 2000. Therefore, the following species are included in this assessment from the Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (1999), and the State of Washington Department of Fish and Wildlife species list. This list was developed by Jeffrey Hass, Heidi Brunkal, Dana Ward, and Larry Cadwell.

## SPECIES

## LISTING STATUS

Ferruginous hawk, <i>Buteo regalis</i>	FSC/ST
Burrowing owl, <i>Athene cunicularia</i>	FSC/SC
Golden eagle, <i>Aquila chrysaetos</i>	SC
Loggerhead shrike, <i>Lanius ludovicianus</i>	FSC/SC
Sage sparrow, <i>Amphispiza belli</i>	SC
Sage thrasher, <i>Oreoscoptes montanus</i>	SC
Western sage grouse, <i>Centrocercus urophasianus</i>	ST
Long-billed curlew, <i>Numenius americanus</i>	SM
Merriam's shrew, <i>Sorex merriami</i>	SC
Pygmy rabbit, <i>Brachylagus idahoensis</i>	FSC/SE
Black-tailed jackrabbit, <i>Lepus californicus</i>	SC
Elk, <i>Cervus elaphus</i>	TI
Mule deer, <i>Odocoileus hemionus</i>	TI
Striped whipsnake, <i>Masticophis taeniatus</i>	SC

The following listed species were identified as occurring, or having habitat within, Benton County. Through post fire reconnaissance and consultation with local experts, it was determined that these species were not affected by the fire because they have no habitat within or adjacent to the fire area, and/or inventories prior to the fire determined absence, outside of range, or not expected to be affected by potential post-fire flooding:

Bald eagle, <i>Haliaeetus leucocephalus</i> (no habitat within fire area)	T/ST
Aleutian Canada goose, <i>Branta canadensis leucopareia</i> (no habitat within fire area)	T/ST
American white pelican, <i>Pelicanus erythrorhynchos</i> (no habitat within fire area)	SE
Peregrine falcon, <i>Falco peregrinus</i> (no habitat within fire area; migratory)	FSC/SE
Sandhill crane, <i>Grus canadensis</i> (no habitat within fire area; migratory)	SE
Common loon, <i>Gavia immer</i> (no habitat within fire area)	SS

Flammulated owl, <i>Otus flammeolus</i> (no habitat within fire area)	SC
Lewis' woodpecker, <i>Melanerpes lewis</i> (no habitat within fire area; transitory)	SC
Northern goshawk, <i>Accipiter gentilis</i> (no habitat within fire area; transitory)	SC
Great blue heron, <i>Ardea herodias</i> (no habitat within fire area)	TI
Pacific (Townsend's) western big-eared bat, <i>Corynorhinus townsendii</i> (no habitat within fire area)	SC
Washington ground squirrel, <i>Spermophilus washingtoni</i> (no habitat within fire area)	SC
Bull trout, <i>Salvelinus confluentus</i> (extirpated from area below fire)	T
Upper Columbia River Spring Chinook Salmon, <i>Onchorynchus tshawytscha</i> (habitat in Columbia River is above confluence with Yakima River)	E
Middle Columbia River Steelhead, <i>Onchorynchus mykiss</i> (habitat in Columbia River is above confluence with Yakima River)	T
Upper Columbia River Steelhead, <i>Onchorynchus mykiss</i> (habitat in Columbia river is above confluence with Yakima River)	T
Columbia pebble snail, <i>Fluminicola columbiana</i> (outside of fire affects area)	C
Shortfaced lanx, <i>Fisherola nuttallii</i> (outside of fire affects area)	C
Columbia river tiger beetle, <i>Cicindela columbica</i> (no habitat within fire area)	SC
Juniper hairstreak, <i>Mitoura siva</i> (no habitat within fire area)	SC
Silver-bordered bog fritillary, <i>Boloria selene atrocastalis</i> (no habitat within fire area)	SC

#### KEY TO LISTING STATUS:

E	FEDERAL ENDANGERED
T	FEDERAL THREATENED
FSC	FEDERAL SPECIES OF CONCERN
SC	STATE CANDIDATE
SE	STATE ENDANGERED
ST	STATE THREATENED
SS	STATE SENSITIVE
SM	STATE MONITOR
TI	TRIBAL IMPORTANCE

#### IV. RECOMMENDATIONS

##### A. Management

1. Determinations of effect: The fire, suppression actions and proposed emergency rehabilitation had no affect to the federally listed species: Bald eagle, Aleutian Canada goose, bull trout, Upper Columbia River spring Chinook salmon, and Middle Columbia River steelhead. These determinations were discussed with, and agreed to by Heidi Brunkal, Jeffrey Haas and Dale Bambrick of FWS, and David Geist and Larry Cadwell of PNNL. Therefore there is no need for emergency Section 7 Consultation for the 24 Command Fire and emergency rehabilitation.



**2. Recommendations with Specifications (see Part F of BAER Report):**

**!** Any determinations documented in this assessment should be reevaluated, and emergency Section 7 Consultation conducted as needed, if additional rehabilitation measures or vegetation management activities are proposed after July 7, 2000. If non-emergency management activities are proposed, another Biological Assessment should be prepared. All non-specification management recommendations made in the 24 Command Fire BAER Report have not been assessed for effects to federally listed species.

**!** Monitoring (specifications included in Section F of this BAER report)

**1. DETERMINE FIRE EFFECTS TO SHRUB-STEPPE DEPENDENT BIRD SPECIES** N-1b Protection of T&E Species: Birds (listed). Monitor fire effects to Agency listed species: ferruginous hawk, burrowing owl, loggerhead shrike, sage sparrow, sage thrasher, western sage grouse and long-billed curlew by determining post fire presence, reproductive status and reproductive success. Monitoring design, purpose and need are discussed in detail in the Specification form.

**2. DETERMINE FIRE EFFECTS AND POST FIRE MOVEMENT OF ELK** S-1d Public Safety: Elk Monitoring. Monitor locations and movement patterns of elk to determine habitat use within and adjacent to the fire area, and locations of road crossings. Monitoring design, purpose and need are discussed in detail in the Specification form.

**3. PUBLIC SAFETY ROAD SIGNS** S-2b Safety Signs - Elk. Warning signs should be installed along Hwy 225 and 240 where there is the potential for elk to cross. Sign design and location, purpose and need are discussed in detail in the Specification form.

If the need is identified, conduct an assessment of effects to species of Tribal importance not addressed in this report. No specification prepared at this time.

**1. Management recommendations that are beyond the scope of BAER (no Specifications):**

**!** Existing wildlife related research and monitoring plots should be reestablished to continue ongoing studies and to obtain new information on fire effects to various species and their habitats.

**!** This fire provides an excellent opportunity for research on fire effects to shrub-steppe dependent species. It is especially important to research management tools for how to provide climax habitat for these species given the vulnerability of this ecosystem to wildfire.

**!** Permanent photo points and monitoring plots should be established in key wildlife habitat locations to monitor habitat recovery. This should be coordinated with the vegetation monitoring as recommended in the 24 Command BAER Vegetation Report.

**!** Small mammal monitoring should be conducted using existing trapping grids and should be expanded as needed to determine prey species abundance for the various fire affected species.

**!** Reptile and amphibian monitoring should be conducted using existing trapping locations and should be expanded as needed to determine potential effects of the fire and associated habitat loss.

## I. CONSULTATIONS

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USDI FWS. *Klamath River and Columbia River Bull Trout Population Segments: Status Summary and Supporting Documents Lists*. 1998.

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Washington Department of Fish and Wildlife State listed species 6/21/2000

**THE FOLLOWING SUPPORTING DOCUMENTATION CAN BE FOUND IN THIS BAER REPORT UNDER APPENDIX V:**

U. S. Fish and Wildlife Service Species list dated 7/3/2000

U. S. National Marine Fisheries Service list dated 5/6/99

Washington Department of Fish and Wildlife State Listed Species dated 6/21/00

WDFW Priority Species: Vulnerable Aggregations and Species of Recreation, Commercial, and/or Tribal Importance dated 8/31/98

Wildlife Species of Concern Occurring on the Hanford Site (from Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement, 9/99)

**Specifications (Part F)**

Other supporting documentation not included in this BAER report is filed in the 24 Command BAER file, including:

ICS 214 Unit logs

Species maps

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**PREPARED BY:**

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**Notes and species writeups from Heidi Brunkal and Larry Cadwell**

**U. S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**24 Command Fire**

**SOIL AND WATERSHED RESOURCE ASSESSMENT**

**I. OBJECTIVES**

- ! Assess overall watershed changes from the fire, particularly those that pose substantial threats to human life, property, and critical natural and cultural resources. This includes evaluating changes to soil conditions, hydrologic function, and watershed response to precipitation events and high winds.**
- ! Identify the most critical soil and watershed areas and issues related to the 24 Command Fire based on increased flood potential and loss of soil resources from water and wind, and prescribe treatments to mitigate impacts and risks.**
- ! Develop a map of burn severity.**
- ! Identify future monitoring needs.**

**II. ISSUES**

- ! Threats to human life and property in and adjacent to the burned area from wind-blown dust.**
- ! Loss of ash, soil and nutrients due to wind erosion that could degrade site productivity.**
- ! Threats to water quality of springs.**

**III. OBSERVATIONS**

**A. Background**

**Geology/Physiography:** The 24 Command Fire occurred within the semi-arid Pasco Basin of the Columbia Plateau on the northeastern flank of Rattlesnake Mountain and part of the southwestern flank near the east end. Elevations of the burn area range from approximately 450 feet (137 m) above mean sea level (amsl) along the Yakima River to 3581 feet (1091 m) amsl atop Rattlesnake Mountain. All burned watersheds drain either southwest toward the Yakima River or northeast to the Cold Creek Valley. The upper northeast-facing portion of Rattlesnake Mountain is steep, with slopes up to 60%.

Rattlesnake Mountain above approximately 2000 feet amsl is underlain by the Miocene Columbia River Basalt which is composed of a multitude of basalt flows interbedded with fluvial and lacustrine sediments consisting of mud, sand, and gravel deposited between volcanic eruptions. These sedimentary interbeds are collectively called the Ellensburg Formation. The Pleistocene Hanford formation underlies much of the lower portions of the northeast flank of Rattlesnake Mountain below

approximately 1000 feet amsl and consists of deposits from a series of cataclysmic floods. These floods occurred when ice dams broke releasing water from glacial Lake Missoula. Two facies are recognized, the Pasco gravels and the Touchet Beds (Kasper and Glantz, 1987). The Pasco gravels consist of coarser sands and gravels that were deposited in high-energy environments of rapid currents. The Touchet Beds consist of finer sands and silts that represent a low-energy (slack water) environment found on the basin margins and the flanks of the surrounding ridges. Holocene surficial deposits consisting of silt and sand form a thin veneer (less than five meters) across much of Cold Creek Valley. These deposits consist dominantly of laterally discontinuous sheets of wind-blown silt and fine-grained sand. Surficial geologic units in the area are shown on a map and described in a report by Hartman (2000).

**Soils:** Hajak (1966) describes 15 different soil types on the Hanford Site. Of these, 12 occur within the burned area. Table 1 shows the extent of soils occurring within the burned portion of the Hanford Site. Approximately 24,000 acres of the burned area occurred in areas not covered by this survey. A soil map is included in Appendix III.

**Table 1. Soil types occurring within the 24 Command Fire burned area.**

Soil Name	Acres	% of Burn
Burbank Loamy Sand	10,695	6.5
Dune Sand	594	0.4
Ephrata Sandy Loam	4,408	2.7
Hezel Sand	11,350	6.9
Koehler Sand	1,149	0.7
Kiona Silt Loam	3,179	1.9
Lickskillet Silt Loam	10,920	6.6
Esquatzel Silt Loam	6,581	4.0
Quincy (Rupert) Sand	43,316	26.4
Ritzville Silt Loam	15,711	9.6
Scootney Stony Silt Loam	2,337	1.4
Warden Silt Loam	28,960	17.7
unsurveyed	24,684	15.1

The Quincy (Rupert), Hezel, and Koehler soils developed in wind-blown sand. They occupy hummocky terraces and dune-like ridges. They cover over 55,000 acres within the burn, or about 1/3 of the area. These soils often occur in association with areas of dune sand.

The Burbank soil contains a loamy sand surface underlain by gravel. It may occur with areas of dune sand.

The Ritzville, Licksillet and Kiona soils occur on hill slopes and ridges. They contain a loam or silt loam surface texture. These soils may be subject to sheet and rill erosion. The Ritzville soils are developed on fine-grained, eolian sand and silt, referred to as loess. The Ritzville and Kiona soils are shallow, while the Licksillet soils are moderately deep to deep.

The Warden soil is a deep soil normally found in foothills below steeper slopes.

The Esquatzel and Scootney soils formed in alluvial deposits. They are deep soils and may be subject to gully erosion because of their position on the landscape.

**Climate and Hydrology:** The climate of the 24 Command burn area is strongly influenced by a rain shadow extending eastward from the Cascade Mountain range. This region, classified as mid-latitude semi-arid, receives less than 8 inches of average annual precipitation and is the hottest and driest portion of the Columbia Basin. Most precipitation falls from October through April and is directly proportional to elevation. Within the burn area, precipitation can vary from as little as 5 inches within Cold Creek Valley (420 feet elevation) to over 14 inches on Rattlesnake Mountain (3,581 feet elevation). Snowfall during December to February accounts for approximately 38% of total precipitation, while the months of July and August typically are the driest. Prevailing winds are from the northwest but occasional strong winds from the southwest also occur. Thunderstorm cells associated with passage of strong cold fronts can produce high velocity winds and localized intense rainfalls. Table 2 indicates what probable rain occurrence and intensity may occur for this region.

**Table 2. Recurrence Intervals and Precipitation Amounts for Storm Events (Hanford Site Climatological Data Summary 1999 with Historical Data)**

Return Period (years)	1 Hour Duration (inches)	24 Hour Duration (inches)
2	0.22	0.70
20	0.44	1.26
100	0.58	1.61



This table indicates that for most probable occurring rainfall events, precipitation would be relatively light and slow.

The fire's hydrologic area can be described as lying within the Pasco Basin of the Columbia River Basin. Perennial reaches of Cold Creek and Dry Creek flow within the burn area. These streams are part of the Yakima River watershed and receive base flows from springs along portions of their reaches. Three major springs - Snively, Lower Snively and Rattlesnake - contribute to less than 3 miles of total perennial flow. Several other small springs occurring along the flanks of Rattlesnake Mountain do not contribute to any substantial surface water flows. Downstream of the confluence of Dry and Cold Creeks, near Rattlesnake Springs, streamflow infiltrates into the sands of the valley bottom. The remaining channel drainages are ephemeral or intermittent, carrying meltwater and storm flows. There are no perennial pour points into either the Yakima or Columbia Rivers from the fire area. The mean annual runoff is low, approximating less than 3% of total precipitation. The basin-wide runoff coefficient is zero for all practical purposes.

The upper slopes of Rattlesnake Mountain influence channel morphology, with the north side inducing steep incised channels and the south side generating more gentle, less discernable channels. Lower flanks of the mountain entrench channels less, allowing the channels to meander and braid and develop flood plains. Any transported flows or sediments along the eastern and northern areas infiltrate and deposit along the flood plains and valley bottom sands. Flows off the west and southwestern areas of Rattlesnake Mountain generally are modified by pipes or diverted for irrigation uses. Only a few ephemeral channels have direct outflow to the Yakima River. However, runoff to the Yakima River is very low if not zero.

Groundwater of the region flows in a general west to east pattern toward the Columbia River. Little groundwater recharge occurs in the Pasco Basin due to limited precipitation. Most precipitation is lost through evapotranspiration with less than 1% recharging groundwater. Studies suggest precipitation may contribute to groundwater recharge in areas where soils are coarse textured and bare of vegetation. In areas of past wildfires, soil moisture measured at depths of 275 centimeters increased when vegetation types changed from sagebrush to grasses. Soil moisture was greatest in late winter. Burned areas are slow to recover from the effects of wildfire, with only sparse shrub cover existing today after wildfires in the 1970s. Throughout much of the shrub-steppe region, microbiotic soil crusts cover some or all of the soil between plants. This microbiotic soil crust facilitates infiltration of precipitation into the soil.

Runoff in the area of the burn is primarily generated by winter precipitation. Warm Chinook winds have been known to cause rapid snowmelt during winter months, inducing runoff and minor flooding in the area. Flooding potential of Cold Creek was calculated by Skaggs and Walters, 1981, for probable maximum conditions. A 100 year flood would be about 3 feet deep, near the confluence of Cold Creek and its tributary Dry Creek. Dry Creek occasionally has crossed State Route 240 during past flood events.

**Wind and Dust storms:** The predominant wind direction within the burn area is from the northwest. However, the strongest winds blow out of the southwest, although less frequently than from the northwest (Fayer et al., 1999). Winds capable of moving sand-sized particles occur approximately 40 days per year. Seasonal changes in the average wind direction are not very large, but changes in the average wind speed can be fairly significant (U.S. Department of Energy, 1988). June has the

highest average monthly wind speed (9.2 mi/hr (4.1m/s)), and the prevailing wind direction is from the west-northwest. In November and December, average wind speeds fall to a minimum of 6.0 mi/hr (2.7 m/s), and the prevailing direction is from the northwest. Average diurnal changes in both wind speed and direction can be large, especially during the summer months. In July, hourly average wind speeds range from a low of 5.6 mi/hr (2.5 m/s) between 0900 and 1000 to a high of over 13.0 mi/hr (5.8 m/s) between 2100 and 2200. High-speed, gusty winds can occur any month of the year and reach the greatest velocities during the winter months. The maximum recorded peak gust at 50 ft (15.2 m) above the ground at the Hanford Meteorology Station is 80 mi/hr (36 m/s).

An average of eight dust storms a year that decrease visibility to below 6.2 mi (10 km) occur at the Hanford Meteorology Station (U.S. Department of Energy, 1988). These dust storms last an average of just over three hours, but have lasted as long as 18 hours. The sand and dry soil of the Pasco Basin and local construction and agricultural activities are all sources of airborne dust in the area. Dust storms occur most frequently from March through May and also in September. Dust devils occur frequently on sunny days with light winds and seldom last for more than a few minutes.

Sand drift potential in most of the burn area is the result of winds from the southwest (Glantz et al, 1990). Winds from the west and northwest also have some sand transport potential, but these components are small compared to the influence of southwesterly winds. Direction of sand drift varies with season. In the winter, sand drift potential is dominated by winds from the southwest. In the spring, the sand drift potential is governed by winds from the northwest, but the magnitude of the sand drift is the lowest of all seasons. In the summer, sand drift potential is governed by winds from the northwest. In the fall, the sand drift potential is dominated by winds from the southwest. During all seasons, the sand drift potential is greater after noon than before noon.

A well developed band of sand dunes trending roughly east-west transects a part of the burn area. These dunes formed as a result of strong W-SW winds blowing across the Hanford Site and up Ringold-Koontz Coulee, a natural low point for winds blowing through the basin. Most of this dune field is stabilized, but could likely become reactivated if anchoring vegetation is lost (Fayer et al., 1999).

## **B. Reconnaissance Methodology**

The purpose of a burned area assessment is to determine if the fire caused emergency watershed conditions. If an emergency is not found, then the assessment stops. If emergency watershed conditions are found, then the magnitude and scope of the emergency is mapped and described, values at risk and resources to be protected are identified, and treatment prescriptions are developed to protect the values at risk. Emergency watershed conditions include both hydrologic and soil factors; typically potential for flash floods and debris flows and deterioration of soil condition, particularly loss of soil structure, leading to a decline in soil productivity. On occasion loss of vegetative cover may also contribute to wind erosion. Table 3 describes terms commonly used in assessing soils and watersheds that have been burned.

**Table 3. Definitions of terms commonly used in soil and watershed assessments.**

Term	Definition
Fire Intensity	Based on temperature, flame length, heat of combustion and total amount and size of fuel consumed. Accounts for convective heat rising into the atmosphere and fire effects on the overstory.
Fire Severity	Based on temperature, moisture content of duff and fuels lying on the ground, heat of combustion and total amount of duff and ground vegetation consumed. Accounts for the amount of conductive and radiant heat that goes down into the soil, affecting soil characteristics.
Burn Severity	A relative measure of the degree of change in a watershed that relates to the severity of the effects of the fire on watershed conditions. Burn severity is delineated on topographic maps as polygons labeled high, moderate, and low/unburned.
Watershed Response	A qualitative degree and/or modeled measure of how a watershed will respond to precipitation. Parameters include pre-existing soil moisture; amount and duration of rainfall; lag time between initiation of storm and peak flow runoff; and peak flow discharge (maximum cfs generated by a storm) and sediment yield. Changes in the characteristics of a watershed brought about by a fire increase the efficiency with which a watershed yields runoff. Burned watersheds shed more water faster.

Aerial reconnaissance survey and field evaluation were conducted to identify the spatial distribution and extent of the fire severity and resulting burn severity and soil conditions. Field evaluations included, but were not limited to:

- ! edaphic fire effects;
- ! areal extent and strength of hydrophobic soil conditions;
- ! mapping burn severity;
- ! current channel and culvert capabilities;
- ! threats to structures and facilities from storm flow and debris;
- ! threats to human life and property from wind-blown dust.

**Burn Severity:** Burn severity is not the same concept as fire intensity and fire severity as recognized by fire behavior specialists. Fire intensity and fire severity relate to fire effects on overstory and understory vegetation, respectively, while burn severity relates specifically to effects of the fire on soil conditions and hydrologic function (e.g., amount of surface litter, erodibility, infiltration rate, runoff response). Although burn severity is not primarily a reflection of effects of fire to vegetation, vegetative conditions and pre-fire vegetation density are among indicators used to assess burn severity.

Site indicators used to evaluate and map burn severity include soil hydrophobicity (water repellency), ash depth and color (fire severity), size of residual fuels (fire intensity), soil texture and structure, and post-fire effective ground cover. These criteria indicate fire residence time, depth of litter layer consumed, radiant heat throughout the litter layer and ease of detachability of

the surface soil. Using these indicators, burned areas are mapped into three relative burn severity categories. These include high, moderate, and low/unburned.

In some cases there may be complete consumption of vegetation by fire, with little effect on soil and watershed function. In general, the denser the pre-fire vegetation, the longer the residence time and the more severe are the effects of the fire on soil hydrologic function. For example, deep ash after a fire usually indicates a deeper litter layer prior to the fire, which generally supports longer residence times.

Increased residence times promote the formation of water repellant layers at or near the soil surface, and loss of soil structural stability. The results are increased runoff and soil particle detachment by water and transport off-site (erosion). The presence of white ash indicates a hotter fire and more complete consumption of organic matter. Powdery ash without identifiable remnants of twigs and leaf litter also indicates more complete consumption.

Generally there is a close correlation between soil properties and the amount of heat experienced by the soil as well as the residence time of the heat in contact with the soil.

The burn severity map then becomes a basis to predict the hydrologic response of soil to the fire, and the rate of natural revegetation of the site following the fire.

It is important to note that burned area map units are usually mapped at no less than 40 acres in size and may include areas of other burn severity, but which are too small to segregate. Small areas of different burn severity can therefore be present in each map unit.

**Soil Conditions:** Edaphic fire effects were evaluated for several parameters that affect soil conditions. These parameters are hydrophobicity, changes in vegetative ground cover and soil structure, and susceptibility to wind erosion. Hydrophobicity was evaluated by observing the depth and thickness of a water repellent horizon in surface soils where it exists, and duration of a water drop beading on this surface. Changes in vegetative ground cover as affected by the fire were noted and compared to pre-fire conditions. Loss of soil structure is usually indicated by a change to a powdery soil. Soils susceptible to wind erosion were examined in the field to determine if there was an increased risk of erosion. Soil survey maps and air photos were used to assist in making predictions of areas with the greatest risks of wind or water erosion.

**Formation of Hydrophobic Soil:** When soils are heated by fire, one result can be development of a hydrophobic layer on or in the surface soil horizon. This occurs due to volatilization of organic matter in and on the surface soil that have high amounts of lignin and other waxy compounds. After the fire passes, the gasses cool to a waxy coating on soil particles. The effect is similar to putting wax on a car to cause water to bead up and run off. If the hydrophobic layer is thick, or the degree of water repellency is strong, it can seriously inhibit infiltration of rainfall, increase runoff and detach surface soil particles, which increases flooding, erosion and sedimentation. Some soils can be significantly hydrophobic, even without fire. Vegetation type, amount of organic matter and soil texture are the primary factors that determine whether or not soils will become hydrophobic.

**Watershed Response:** On-the-ground field observations and aerial reconnaissance were conducted to determine the potential for high runoff response. Channel morphology related to transport and deposition processes were noted, along with channel crossings and stream outlets. Observations included condition of riparian vegetation along seeps, springs, and perennial streams and the potential for vegetational loss and/or conversion. Burn severity and changes in soil infiltration were considered for runoff potential. A literature search of local and regional documented studies was conducted and local scientists were consulted about past watershed responses to wildfires.

### C. Findings

**Burn Severity:** The 24 Command Fire burned through shrub-steppe plant communities. While fire intensity varied throughout the burn area, the rapid rate of fire spread through predominantly fine fuels with light fuel loading produced short fire residence times. The resulting burn severity is low throughout the burn area. Exceptions include a few isolated unburned patches that are too small to map separately and spots where individual large shrubs completely burned.. Table 4 is a summary of burn severity acres and percentages by category that was determined for the 24 Command Fire area. A burn severity map is included in Appendix IV.

Table 4. Summary of burn severity acres and percentages found on the 24 Command Fire.

Burn Severity	Acres	Percent
High	0	0
Moderate	0	0
Low	163,884	100
Total	163,884	100

**Soil Conditions, Values at Risk, and Resources to be Protected:** Most of the soils examined were not water repellent. The few areas of water repellent soils were usually associated with large plants that had been consumed or, in a few cases, microbotic crusts that had been burned. In nearly all cases, the water repellency was weak. Most of the microbotic soil crusts tested absorbed water readily. Almost all plant and litter cover that was present in the burn area have been consumed by the fire. The loss of vegetative cover has exposed fine sandy and silty soils to ablation.

Nearly all soils within the burn area have a fairly high risk of wind erosion, however, certain soils within the burn area are especially susceptible. Areas with soils having the highest risk of wind erosion are shown on the Wind Erosion Map in Appendix IV. The soils most subject to wind erosion are the Quincy (Rupert), Hezel, and Koehler soils, sand dune areas, and to a lesser extent the Burbank soil. These soils cover approximately 55,000, acres or 1/3 of the burn. Other small areas of soils subject to wind erosion are scattered throughout the burn. These soils have lost most of the vegetation that had been

providing stability and some of the microbiotic soil crusts that had offered protection against erosion have also been burned. When soils vulnerable to wind erosion are stripped of vegetation, soil particles become available for transport by the wind through either surface creep, saltation or suspension. Sand particles, especially larger ones, tend to move by surface creep (rolling or sliding along the ground) and form migrating sand dunes. Finer particles, especially silt and clay, tend to become airborne by saltation and rise high, travel far, and remain in suspension until rain washes them down or when the wind subsides (Chepil,1957).

Dust storms can create serious visibility problems on highways. The greatest risk of dust storms as a result of the fire occurs along State Highway 240 and other roads within the Hanford Site. Wind erosion is not expected to impact water quality in the Columbia or Yakima Rivers as most of the fine soil particles are expected to travel far from the area. Although wind erosion will not threaten water quality, it may hamper vegetative recovery. In many places, vegetation that has started to regrow can be buried or otherwise damaged by the blowing and shifting sand. It may take many years before these areas have re-established enough vegetation to reduce wind erosion.

Microbiotic soil comprised of mosses, lichen and cyanobacteria form a thin crust that greatly aids in stabilizing soil surfaces. These organisms are readily killed by fire, especially when in close proximity to shrubs burned during a fire. Under low burn severity conditions cyano-bacteria occupying shrub inter-spaces have a greater likelihood of survival because they occur below the moss/lichen crust, usually in the top 0.5 cm of soil, where they are protected from the heat. Airborne spores of cyanobacteria from these inter-spaces can inoculate other areas of the burn, enabling rapid recovery of these organisms and providing a modest stabilizing influence on soil surfaces until the moss and lichen crust is re-established.

Recovery of mosses and lichen primarily depends on the area of coverage affected by the fire, how much crust was burned, and amount of rainfall the burned area receives after the fire. Recovery of these organisms after a fire is often much slower than recovery of cyanobacteria, especially if there are few or no unburned islands well within the burned area to function as a propagating source, as is the situation created by the 24 Command Fire. Recovery to the interior of the burned area may take as long as 20 years or greater, depending on the degree and areal extent of mortality cause by the fire.

The potential for sheet and rill erosion is expected to increase within parts of the burn area. The soil most susceptible to this type of erosion are the Ritzville, Licksillet, and Kiona soils which occur on steeper slopes. These soils will have accelerated erosion until the vegetative cover returns to normal. Other soils within the burn have a lower risk of water erosion. It may take several years before the vegetation recovers sufficiently to allow sheet and rill erosion to return to pre-fire rates.

Runoff may increase on some of the slopes. Reduced vegetative cover and soil crusting that develops from rain drop impact will cause lower infiltration rates. Soils higher in silt will be more likely to develop surface crusts than sandy soils. Because of increased runoff, the potential for gully erosion will increase in low-lying areas. Due to their position on the landscape, the Esquatzel and Scootney soils are most susceptible to gully erosion.

Sedimentation may occur in some of the springs within the burn because of increased erosion in the contributing watershed.

**Watershed Response, Values at Risk, and Resources to be Protected:** Because burn severity was low over the entire burn area, infiltration rates are not expected to decrease due to soil hydrophobicity. Areas with hydrophobicity were spotty and discontinuous and would not contribute to overland flow. Loss of vegetative cover will decrease infiltration rates for approximately the next 3 years. However, existing conditions prior to the fire already contributed to reduced infiltration rates. These conditions include sparse vegetation throughout the burn area, rocky slopes and shallow soils on Rattlesnake Mountain, and, on the southwest flank of Rattlesnake Mountain, compaction due to grazing. Prior runoff and flooding events have been recorded during winter months from snowmelt over frozen soils when vegetation has negligible effects to runoff. Therefore, the overall relative water yield increase due to the fire is expected to be minor and not exacerbate flooding events. In areas where sagebrush cover was lost, minor increases in groundwater recharge may occur due to conversion to grasses which evapotranspire at lower rates and from shallower soil depths than sagebrush. The microbiotic soil crust cover, where undisturbed, should continue to facilitate infiltration.

Some rill erosion is expected on steep slopes of the northern and eastern flanks of Rattlesnake Mountain. These sediments may be transported down into the stream network of Dry Creek, Cold Creek, and their springs during runoff events. Most entrained sediments would be deposited along the lower gradient floodplains and sandy valley bottoms. Localized effects should be expected but overall effects to the watershed would be minor. Additionally, riparian vegetation was lost at Snively, Lower Snively and Rattlesnake Springs. An initial flush of sediment and ash is expected to these springs and perennial streams from affected riparian areas but amounts would be minimal. Because these systems do not have direct outlets to the Yakima River, no effect from sediment to the river is expected. Ephemeral streams on the south side of Rattlesnake Mountain may transport an initial flush of sediment and ash into the Yakima River but because of the small spatial size of these subwatersheds, any inputs would have immeasurable effects. Water temperatures may increase along perennial reaches and springs due to loss of shade-providing riparian vegetation.

A retardant load was dropped over Snively Springs contaminating a forty foot swath over water sources. Total chemical input was small. Mitigation for fire retardant effects on aquatic organisms is to avoid drops within 300 feet of waterways where possible. However, it is recognized that some contamination is unavoidable due to drift and the need to protect other resources from fire. After recent studies, retardant components were reformulated this past spring to minimize toxic effects to aquatic organisms. No Federally listed threatened or endangered species are reported for Snively Springs. Some unknown localized effect to aquatic organisms may occur but because Dry Creek's flow infiltrates in valley sand bottoms, no effect to the Yakima River is expected.

Overtopping of an engine tank resulted in a small amount of suppression foam spilling into a pond at Rattlesnake Springs. This foam solution was diluted by a full tank of water and further diluted by the pond's volume. Cold Creek infiltrates into valley sand bottoms just below Rattlesnake Springs so no water surface transport of the pollutant occurred beyond this point. Some unknown localized effect to aquatic organisms may occur in the pond but the overall effect to water quality is minor.

#### **IV. RECOMMENDATIONS**

##### **A. Management (specification related)**

1. Install drift fencing along roadways maintained by DOE-Hanford to control blowing sand.

**Situation:** Stabilized and quasi-stabilized sand and silt areas that were burned have lost all or most of their protective vegetation. Wind will increase erosion of sand and dust from these source areas beyond pre-fire ablation conditions, leading to reactivation of sand dunes in portions of the burned area. This will cause sand dunes to migrate in an east to northeast direction based on direction of past dune migration. Dunes may migrate onto roadways, increasing the risk of vehicular accidents in and adjacent to the burned area, including risk of human injury and/or fatalities.

**Recommendation:** Install 9 miles of drift fence along DOE roadways.(See Part F Specification: S-1b Public Safety: Drift Fencing.)

**B. Monitoring (specification related)**

1. Inventory mortality and monitor recovery of microbiotic soil crust.

**Situation:** The degree and extent of microbiotic soil mortality within the burn is unknown. With few unburned islands within the burn to function as propagation sources recovery may take decades. Soils that were previously partially stabilized by vegetation and microbiotic soil crusts may become more now unstable and more readily susceptible to wind erosion due to the loss of vegetation and possible microbiotic soil crust mortality. Increased soil erosion will lead to the occurrence of dust storms, which will increase the risk of vehicular accidents on highway 240 and roads within the Hanford Site, including risk of human injury and/or fatalities.

**Recommendation:** Inventory microbiotic soil crust (MSC) mortality and monitor recovery within the burn area to determine the degree and extent of mortality. The inventory and monitoring should be conducted during the first year with monitoring continuing through the second year. The information learned will be made available to DOE/USFWS to determine whether or not mitigation action is necessary. Mitigation would be to inoculate dead zones with microbiotic soil specimens composed of similar species collected from an unburned area with the same soil types. Any continued monitoring and/or mitigation needs will be submitted as a supplemental funding request. (See Part F Specification M-1b Monitoring: Microbiotic Soil Crust.)

**C. Management (non-specification related)**

- I. Post dust hazard warning signs along state highways and DOE roads and evaluate the need to have advisories recorded on radio station AM 530.

**Situation:** Stabilized and quasi-stabilized sand and silt areas that were burned have lost all or most of their protective vegetation. Wind will increase erosion of sand and dust from these source areas beyond pre-fire ablation conditions, leading to reactivation of sand dunes and development of dust storms in portions of the burned area. In particular, dust storms in and immediately downwind of these eolian sources will greatly diminish visibility. Motorists driving on



State Highway 240, access roads to DOE sites in the Hanford Site, and immediately downwind of the burned area are at an increased risk of experiencing dust storms and sand sheet movement across these roads. There is an increased risk of vehicular accidents in and adjacent to the burned area, including risk of human injury and/or fatalities. The BAER team recommended to WADOT that permanent, changeable dust warning signs be installed on highway 240 and also suggested that an advisory message be played on radio Am 530. WADOT said that they would prefer to close the road when visibility got really bad and post temporary dust warning signs as needed.

**Recommendation:** Convene a multi-agency meeting to assess the need, type, and number of road hazard warning and safety messages to be posted along state highways and DOE access roads crossing the burned area of the Hanford Site. The need to implement radio advisory messages should also be assessed. Participants should include at a minimum the USFWS, DOE-Hanford, and the Washington State Department of Transportation.

2. **Maintain restricted access to the ALER to protect microbiotic crusts from disturbance.**

**Situation:** Microbiotic soil crusts offer protection from soil erosion and increase infiltration of precipitation. These organisms are vulnerable to disturbance from vehicles and foot traffic. Prior to the fire many roads had restricted access which also limited cross-country foot traffic.

**Recommendation:** Close roads that were opened for fire access. Maintain restricted access on all other roads. Maintain educational awareness about the need to minimize soil disturbance when hiking in the ALER.

3. **Clean and maintain all culverts in areas affected by the fire.**

**Situation:** Many of the culverts on roads within the fire area are completely plugged with sediment and debris. These culverts will not function as designed during high flows, causing the roads to wash out.

**Recommendation:** Assess all roads within the burn area, clean existing sediment and debris from culvert inlets and outlets, and replace culverts as necessary.

**D. Monitoring (non-specification related)**

1. **Monitor roadways maintained by Washington DOT to determine if drift fencing is needed to control blowing sand.**

**Situation:** Stabilized and quasi-stabilized sand and silt areas that were burned have lost all or most of their protective vegetation. Wind will increase erosion of sand and dust from these source areas beyond pre-fire ablation conditions, leading to reactivation of sand dunes in portions of the burned area. This will cause sand dunes to migrate in an east to northeast direction based on direction of past dune migration. Dunes may migrate onto roadways, increasing the risk of vehicular accidents in and adjacent to the burned area, including risk of human injury and/or fatalities. The BAER team recommended to WADOT that drift fences be installed along the southwest side of the portion of highway

240 that crosses the dune fields. WaDOT stated that they thought the sand would blow all the way across the road and not accumulate on the roadway. They preferred to monitor the sand movement and install drift fences if necessary.

**Recommendation:** WaDOT should monitor sand movement across state highways during wind events to determine where and how much sand is moving across and accumulating on the roadways. Evaluate the need to install drift fences along roadways. Evaluate location and distribution of reactivated sand transport, and its potential impact on road system. (This could be done by comparing time sequence of air photos.) If it is determined that drift fences are needed, a supplemental funding request can be submitted.

## **V. CONSULTATIONS**

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**U. S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION TEAM**

**24 Command Fire**

**OPERATIONS ASSESSMENT**

**I. OBJECTIVES**

- ! Identify, inventory, and map fire suppression impacts on jurisdictions affected by the fire.**
- ! Specify rehabilitation measures to mitigate fire suppression impacts.**
- ! Coordinate with local agencies so that specification recommendations are consistent with agency objectives.**
- ! Protect natural and cultural resource values during rehabilitation efforts.**

**II. ISSUES**

- ! Critical natural and cultural resources.**
- ! Extensive soil disturbance on highly erodible soils from fire suppression activities.**
- ! Removal of fire retardant on Department of Energy (DOE) structures (LIGO).**
- ! Removal of burned DOE Fire engine from U.S. Fish and Wildlife Service (FWS) land.**
- ! Safety associated with three hazzardous openings located within the fire area.**
- ! Damage to fences within fire perimeter associated with fire suppression actions.**

**III. OBSERVATIONS**

**A. Background**

The 24 Command fire, initially referred to as the Two Forks Fire, or the SR24-Mp36 Fire started on Tuesday, June 27, 2000 about 1330 hours as a result of a fatal motor vehicle accident on state route (SR) 24, about 2 miles west of the intersection of SR 240. Driven by high winds and temperatures, and low humidity, the fire quickly spread over the next two days and consumed 163,884 acres of Federal, state, and private lands.

The fire burned in a sage/grassland fuel type under extreme weather conditions. On the afternoon of July 27th the fire spread mostly from northwest to southwest and was pushed by 35 mile per hour winds. Rates of spread were observed to be about 60-80 chains per hour (3960-5280 ft/hr) with flame lengths of about 5-20 feet. The morning of the 28th the fire was estimated to be about 20,000 acres in size and continued to grow throughout the day. Beginning about 1700 the fire behavior noticeably increased with flame lengths reported to be 15-20 feet, and rates of spread of 100-200 chains per hour (6,600-13,200 ft/hr). By about 1800 on the July 28<sup>th</sup>, the fire was about 40,000 acres and the power of the fire became stronger than the power of the wind, and it became plume dominated. This is about the time when the fire encountered a high concentration of fuels and eventually moved into the populated outskirts of Benton City and West Richland consuming eleven residential structures and numerous out buildings and vehicles. On July 29<sup>th</sup> there was approximately 160,000 acres burned.

The 24 Command fire was contained on July 1, 2000 at 1800 and controlled on July 2, 2000 at 1800, and had approximately 750 fire personnel assigned at the peak of fire activity.

## B. Reconnaissance Methodology and Results

On June 30-July 5, 2000, BAER Team personnel began evaluating resource impacts caused by the suppression effort. Team members did reconnaissance from the ground and the air, as well as obtained information from local sources. Information was also gathered from interviews with Division Supervisors, and from the Situation Unit attached to the Fire Incident Management Team.

## C. Findings

The table below summarizes by agency the acreage of the fire, type of suppression line, and length of line to be rehabilitated.

ADMINISTRATIVE UNIT	FIRE ACREAGE	SUPPRESSION LINE TYPE	DOZER LINE
U.S. Fish and Wildlife Service	78,732	Dozer Line	.45
Department of Energy	60,254	Dozer Line	25.97
Private	20,225	Dozer Line	3.47
State	3,633	Dozer Line	10.41
Bureau of Land Management	980	Dozer Line	.5

McGee Riverlands	60	----	----
Totals	163,884	Dozer Line	40.8

Rehabilitation of suppression line is necessary to protect habitats from noxious weed infestation, visual intrusion on the landscape and to minimize fragmentation of ecological areas. Monitoring of suppression lines is necessary to determine the need for future noxious weed mitigation needs. Dozer lines within the burned area on lands managed by FWS and DOE will be treated according to methods described in the Hanford Site Biological Resource Management Plan (HSBRMP, 1996). Private land owners to the west of the fire (Robyn Robert) initially stated that he did not want dozer lines on his private lands rehabed. At the agency close out he stated that he may be interested in getting it done. Private land owners will need to be contacted prior to rehab efforts to identify if rehab work will be done on their lands. Dozer line along Hwy #225 will be treated in the same manner as HSBRMP Category 1 sites at the request of Bureau of Land Management and Washington Department of Fish and Wildlife.



There are five types of suppression impacts to be considered:

- ! Graded Roads: Existing roads which were graded to act as suppression line.
- ! Dozer Line on Private Lands: Dozer line built on private lands on the west end of the fire.
- ! Dozer Line on State/BLM: Fire break built along Hwy #225.
- ! HSRMP Category 1: Fire break built on ALE or DOE lands in areas which require no restoration, but which may receive noxious weed mitigation.
- ! HSRMP Category 3: Dozer line built on FWS or DOE lands which require restoration and revegetation.

**Graded Roads:** Three road sections in the Snively springs area, off of road #118 require revegetation and noxious weed monitoring where a push berm was created as a result of the road being graded. Should exotic plants be identified along the graded road edge, the application of herbicide, plant pulling or cultural remediation treatments should occur. See specification for noxious weed monitoring and native plant reseeding.

**HSRMP Category 1, Non-Habitat of Concern, and Dozer Line on State and BLM lands:** Noxious weed monitoring should occur in these areas. If noxious weeds are identified along the fire breaks, the application of herbicide, plant pulling or cultural remediation treatments should occur in accordance with agency IPM practices. See specification for noxious weeds.

**HSRMP Category 3, Late -Successional Shrub-Steppe:** Three areas identified on the Suppression Impacts GIS data layer require rehabilitation to a more natural condition. On DOE lands a four wheel drive tractor with a weighted drag or a gannon box attachment should drag the suppression lines and push berms to reduce the berm to contour. A drill seeder should apply native plant seed to meet HSRMP specifications. If noxious weeds are identified along the dozer line, the application of herbicide, plant pulling or cultural remediation treatments should occur. On FWS lands a 20 person hand crew should pull the berm on the dozer line and rake the disturbed area to contour. Site selected plant material should be used to rehabilitate the disturbed area.

The following are other suppression impacts observed. During the course of the suppression actions, one of the structures on DOE land was hit by a Load of retardant. This left a red stain on one of the tunnels at the LIGO facility. Fences located within and around the fire area were cut to allow access for fire suppression vehicles. A Type IV engine was burned over during the fire and is currently disabled and located on FWS land. During a reconnaissance flight BAER staff observed an open mine shaft or well just south of the fire origin which poses a safety hazzard to those in the area. There is also two other concrete conical hazzardous openings located around the Nike missile site .

Many of the roads within the fire area that were used for suppression actions are now impassible due do the amount of lose powdery soils resulting from the destruction of soil structure in the upper horizons. Some of these roads have been signed and closed for the present time.

#### IV. RECOMMENDATIONS

**A. Management (specification related)**

- ! Dozer Line Rehabilitation.** Rehabilitate dozer lines and other sites directly or indirectly impacted by fire suppression activities (BAER Spec F-1 Suppression- Dozer Line Rehabilitation). Dozer line rehab should be done at a later date due to the degraded soil conditions at this time. This activity should take place in the late fall or early winter when soil moisture content is higher.
- ! Infrastructure Repair and Replace.** Remove retardant from LIGO Tunnel with mobile power washer (BAER spec F-3b Infrastructure Repair/Replace).
- ! Construction/Structural Cleanup.** Remove burned DOE fire engine from FWS land. (BAER spec F5 Suppression Equipment Removal/Disposal).
- ! Construction/Structural Stabilization and Cleanup.** Mitigate mine shaft hazard with safety fence and hazard signs (BAER spec S1-c Public Safety - Ground Hazards).
- ! Fence Repair.** Repair suppression damaged fence around perimeter of the fire and along highway #240 (BAER spec F-3a Fence Repair/Replace).

**B. Management (non-specification related)**

- ! Continue to review rehabilitation specifications with operators and other personnel associated with implementation of the BAER Plan to insure rehabilitation specifications are clearly understood for protection of sensitive resources and land productivity..**
- ! Guarantee safety of personnel assigned to rehab operational assignments in the fire area.**
- ! Monitor suppression related damage on dirt roads following fall and winter moisture events to see if additional rehab measures are necessary.**
- ! Evaluate necessity of interior fences on FWS land and make management decisions to remove or repair them.**

**V. CONSULTATIONS**

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**U.S. DEPARTMENT OF THE INTERIOR  
BURNED AREA EMERGENCY REHABILITATION**

**APPENDIX II. ENVIRONMENTAL COMPLIANCE**

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- ! Environmental Compliance Considerations, Documentation, and Consultations**
- ! NEPA Categorical Exclusion Documentation and Decision**







## ENVIRONMENTAL COMPLIANCE CONSIDERATIONS, DOCUMENTATION, AND CONSULTATIONS

### 24 Command Fire Burned Area Emergency Rehabilitation Plan

#### A. FEDERAL, STATE, AND PRIVATE LANDS ENVIRONMENTAL COMPLIANCE RESPONSIBILITIES

All projects proposed in the 24 Command Fire Burned Area Emergency Rehabilitation (BAER) Plan that are prescribed, funded, or implemented by Federal agencies on Federal, State, or private lands are subject to compliance with the *National Environmental Policy Act* (NEPA) in accordance with the guidelines provided by the *Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508)*; *Department of the Interior Manual, Part 516, U.S. Fish and Wildlife Service, NEPA Guidelines, Part 516 DM 6, Appendix 1*; and *DOE, NEPA Regulations (10 CFR Part 1021)*. This Appendix documents the BAER Team considerations of NEPA compliance requirements for prescribed rehabilitation and monitoring actions described in this plan for all jurisdictions affected by the 24 Command Fire burned area emergency.

#### B. RELATED PLANS AND CUMULATIVE IMPACTS ANALYSIS

*Draft Hanford Biological Resources Management Plan and Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement:* The BAER Team Environmental Protection Specialist reviewed the *Draft Hanford Biological Resources Management Plan (1996)* and *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement (September 1999)* and in consultation with the Department of Energy (DOE) NEPA coordinator determined that actions proposed in the 24 Command Fire BAER Plan within the boundary of the Hanford National Laboratory are consistent with the management objectives established in the Land-Use Plan. The EIS incorporates the management plan by reference. The EIS/management plan specifically addresses bulldozer lines and provides NEPA compliance for bulldozer line rehabilitation under NEPA.

*Arid Lands Ecology (ALE) Facility Management Plan:* The BAER Team Environmental Protection Specialist reviewed the *Arid Lands Ecology (ALE) Facility Management Plan (1993)* and determined that actions proposed in the 24 Command Fire BAER Plan within the boundaries of the ALE, now incorporated as part of the Hanford Reach National Monument, is consistent with the plan.

**Cumulative Impact Analysis:** Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, both Federal and non-Federal. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. The emergency protection and rehabilitation treatments for areas affected by the 24 Command Fire, as proposed in the 24 Command Fire BAER Plan, do not result in an intensity of impact (i.e. major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

#### C. APPLICABLE AND RELEVANT CATEGORICAL EXCLUSIONS



U.S. Fish and Wildlife Service: The individual actions proposed in this plan for Hanford Reach National Monument are Categorical Exclusions from further environmental analysis as provided for in the Department of the Interior Manual Part 516 and U.S. Fish and Wildlife Service, NEPA Guidelines, Part 516 DM 6, Appendix 1. All applicable and relevant Department and Agency Categorical Exclusions are listed below. Department exceptions (516) DM 2.3 do not apply to any of the individual actions proposed. Categorical Exclusion decisions were made with consideration given to the results of required emergency consultations completed by the BAER Team and documented in Section E below.

#### **Applicable Departmental Categorical Exclusions**

516 DM2 App. 2, 1.6	Non-destructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research and monitoring activities.
516 DM 6 App. 4.4 A	Operations, maintenance, and replacement of existing facilities (includes road maintenance).
516 DM 6 App. 4.4 L(5)	Emergency road repairs under 23 U.S.C. 125.
516 DM 6 App. 7.4 C(3)	Routine maintenance and repairs to non-historic structures, facilities, utilities, grounds and trails.
516 DM 6 App. 7.4 C(19)	Landscaping and landscape maintenance in previously disturbed or developed areas.

#### **Applicable U.S. Fish and Wildlife Service Categorical Exclusions**

516 DM 6 App. 1.4B (1)	Research, inventory, and information collection activities directly related to the conservation of fish and wildlife resources which involve negligible animal mortality of habitat destruction, no introduction of contaminants, or no introduction of organisms not indigenous to the affected ecosystem.
516 DM 6 App. 1.4B (3) i	The installation of fences.
516 DM 6 App. 1.4B (3)iii	The planting of seeds or seedlings and other minor revegetation actions.
516 DM 6 App. 1.4B (3)v	The development of limited access for routine maintenance and management purposes.
516 DM 6 App. 1.4B (5)	Fire management activities, including prevention and restoration measures, when conducted in accordance with Departmental and Service procedures.516 DM 6 App. 1.4B (6) The reintroduction or supplementation (e.g. stocking) of native, formerly native, or established species into suitable habitat within their historic or established range, where no or negligible environmental disturbances are anticipated.

#### **Applicable U.S. Department of Energy Categorical Exclusions**

10 CFR 1021 D App. B1.3	Routine maintenance activities and custodial services for buildings, structures, rights-of-way, infrastructures (e.g., pathways, roads, and railroads), vehicles and equipment, and localized vegetation and pest control, during which operations may be suspended and resumed. Custodial services are activities to preserve facility appearance....Routine maintenance activities include, but are not limited to:
10 CFR 1021 D App. B1.3h	Repair of road embankments
10 CFR 1021 D App. B1.3j	Road and parking area resurfacing, including construction of temporary access to facilitate resurfacing;
10 CFR 1021 D App. B1.3k	Erosion control and soil stabilization measures (such as reseeding and revegetation)
10 CFR 1021 D App. B1.11	Installation of fencing, including that for border marking

10 CFR 1021 D App. B1.15	Siting, construction (or modification), and operation of support buildings and support structures... within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible). Covered support buildings and structures include those for office purposes; ...fire protection; and similar support purposes, but excluding facilities for waste storage activities, except as provided in other parts of this appendix that will not adversely affect wildlife movements or surface water flow.
10 CFR 1021 D App. B1.20	Small-scale activities undertaken to protect, restore, or improve fish and wildlife habitat, fish passage facilities (such as fish ladders or minor diversion channels), or fisheries.
10 CFR 1021 D App. B1.32	Traffic flow adjustments to existing roads at DOE sites (including, but not limited to, stop sign or traffic light installation, adjusting direction of traffic flow, and adding turning lanes). Road adjustments such as widening or realignment are not included.
10 CFR 1021 D App. B3.3	Field and laboratory research, inventory, and information collection activities that are directly related to the conservation of fish or wildlife resources and that involve only negligible habitat destruction or population reduction.

#### **D. STATEMENT OF COMPLIANCE FOR THE 24 COMMAND FIRE BURNED AREA EMERGENCY REHABILITATION PLAN**

This section documents consideration given to the requirements of specific environmental laws in the development of the 24 Command Fire BAER Plan. Specific consultations initiated or completed during development and implementation of this plan are also documented. The following executive orders and legislative acts have been reviewed as they apply to the 24 Command Fire BAER Plan:

1. National Historic Preservation Act (NHPA). The BAER Team archeologists have initiated necessary consultation with the Washington State Historic Preservation Office (SHPO) and the Yakama, Umatilla, Nez Perce, and Wanapum Tribes regarding treatments proposed in the 24 Command Fire BAER Plan.
2. Executive Order 11988. Floodplain Management. No treatments are proposed within the 100-year floodplain.
3. Executive Order 11990. Protection of Wetlands. No treatments are proposed within jurisdictional wetlands.
4. Executive Order 12372. Intergovernmental Review. Coordination and consultation is ongoing with affected Tribes, Federal, State, and local agencies. A copy of the BAER Plan will be disseminated to all affected agencies.
5. Executive Order 12892. Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. All Federal actions must address and identify, as appropriate, disproportionately high and adverse human health or low-income populations, and Indian Tribes in the United States. The BAER Team Environmental Protection Specialist has determined that the actions proposed in this plan will result in no adverse human health or environmental effects for minority or low-income populations and Indian Tribes.

6. Endangered Species Act. The BAER Team wildlife biologist and vegetation specialists have consulted with the Service and Washington Department of Fish and Wildlife regarding actions proposed in this plan and potential effects on Federally and State listed species and has determined that there is no effect. Individual agencies are responsible for continued consultations during plan implementation.
7. Secretarial Order 3127. Although contaminated sites are known to occur on properties owned by the Hanford National Laboratory, no treatments are proposed that would affect contaminated sites. There are no known contaminated sites on other jurisdictions affected by the 24 Command Fire.
8. Clean Water Act. No treatments are proposed within jurisdictional wetlands.
9. Clean Air Act. Federal Ambient Air Quality Primary and Secondary Standards are provided by the National Ambient Air Quality Standards, as established by the U.S. Environmental Protection Agency (EPA) (Clean Air Act, 42 U.S.C. 7470, et seq., as amended). The BAER Team Environmental Protection Specialist has determined that treatments prescribed in the 24 Command burned area will have short-term minor impacts to air quality that would not differ significantly from routine land use practices for the area. Long-term, treatments proposed in this plan would be expected to have a beneficial impact to air quality through stabilization of ash and soils within the 24 Command Fire burned area.

## **E. CONSULTATIONS**

### **Department of Energy, Hanford National Laboratory**

Paul Dunigan, NEPA Compliance Officer, Team Leader, NEPA and Cultural Resource Team  
Tom Ferns, Program Manager, Richland Operations Office  
Annabelle L. Rodriguez, NEPA and Cultural Resource Team

## NEPA CATEGORICAL EXCLUSION DOCUMENTATION AND DECISION

### 24 Command Fire Burned Area Emergency Rehabilitation Plan

**NEPA CHECKLIST:** If any of the following exception applies, the BAER plan cannot be Categorically Excluded and an Environmental Assessment (EA) is required.

(Yes) (No)

- ☒ Adversely affect Public Health and Safety
- ☒ Adversely affect historic or cultural resources, wilderness, wild and scenic rivers, aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or Natural Landmarks.
- ☒ Have highly controversial environmental effects.
- ☒ Have highly uncertain environmental effects or involve unique or unknown environmental risks.
- ☒ Establish a precedent resulting in significant environmental effects.
- ☒ Relates to other actions with individually insignificant but cumulatively significant environmental effects.
- ☒ Adversely effects properties listed or eligible for listing in the National Register of Historic Places.
- ☒ Affect a species listed or proposed to be listed as Threatened or Endangered.
- ☒ Threaten to violate any laws or requirements imposed for the "protection of the environment" such as Executive Order 11988 (Floodplain Management) or Executive Order 11990 (Protection of Wetlands).

## NATIONAL HISTORIC PRESERVATION ACT

### Ground Disturbance:

None

- ☒ Ground disturbance did occur and an archeologist survey, required under section 110 of the NHPA will be prepared. A report will be prepared under contract as specified by the BAER plan.

### A NHPA Clearance Form:

- ☒ Is required because the project may have affected a site that is eligible or on the national register. The clearance form is attached. SHPO has been consulted under Section 106 (**see Cultural** Resource Assessment, Appendix I).
- Is not required because the BAER plan has no potential to affect cultural resources (initial **of** cultural resource specialist).

## OTHER REQUIREMENTS

(Yes) (No)

- ☒ Does the BAER plan have potential to affect any Native American uses? If so, consultation with affiliated tribes is needed.
- ☒ Are any toxic chemicals, including pesticides or treated wood, proposed for use? If so, local agency integrated pest management specialists must be consulted.

I have reviewed the proposals in the 24 Command Burned Area Emergency Rehabilitation Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effect. Therefore it is categorically excluded from further environmental (NEPA) review and documentation. BAER Team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environmental review requirements.

BAER Team, Environmental Protection Specialist

Date

- ( ) I concur and it is my decision to approve the plan.
- ( ) I do not concur because.

Project Leader, Hanford Reach National Monument

Date

- ( ) I concur and it is my decision to approve the plan.
- ( ) I do not concur because.

NEPA Compliance Officer, DOE, Hanford National Laboratory

Date



**U.S. DEPARTMENT OF THE INTERIOR  
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**APPENDIX III. MAPS**

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- ! Shaded Relief**
- ! Fire Perimeter**
- ! Jurisdiction Map**
- ! Suppression Impacts**
- ! Soils**
- ! Burn Severity**
- ! Vegetation Communities**
- ! Vegetation Mortality**
- ! Threatened and Endangered Plant Areas**
- ! Shrub Steppe Obligate Species Habitat**
- ! Noxious Weeds**
- ! Wind Erosion Derivative Map**







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**APPENDIX IV. PHOTO DOCUMENTATION**

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The Majority of the photographs in this document were taken by Kari K. Brown under Federal Contract. She may be contacted at (208) 867-4743. Other photographs were taken by Kathy Criddle, David E. Goeke, David Gonzales, Karen Hayden, Dave Holbeck, and Dave Pitkin.



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**APPENDIX V. SUPPORTING DOCUMENTS**

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- !      Delegation of Authority for the 24 Command Incident**
- !      Presidential Proclamation**
- !      List of Plant Species of Concern**
- !      Dust Advisory**
- !      Newspaper Article**
- !      Memo from Washington State University to the BAER Team**
- !      USFWS T & E Species List for Burn Area**
- !      National Marine Fisheries Service USFWS T & E Species List for Burn Area**
- !      State Listed T & E Species List for Burn Area**
- !      Wildlife Species of Concern on the Hanford Site**
- !      Species of Tribal Importance**

